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UNITED STATES DEPARTMENT OF AGRICULTURE

BULLETIN No. 815

Contribution from the Bureau of Plant Industry
WM. A. TAYLOR, Chief

Washington, D. C. PROFESSIONAL PAPER June 1, 1920

CITRUS-FRUIT IMPROVEMENT
A STUDY OF BUD VARIATION IN THE LISBON LEMON

By

A. D. SHAMEL, Physiologist, L. B. SCOTT, Pomologist, C. S. POMEROY, Assistant Pomologist, and C. L. DYER, Scientific Assistant, Fruit Improvement Investigations, Office of Horticultural and Pomological Investigations

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CITRUS-FRUIT IMPROVEMENT: A STUDY OF BUD VARIATION IN THE LISBON LEMON.[1]

By A. D. Shamel, *Physiologist*, L. B. Scott, *Pomologist*, C. S. Pomeroy, *Assistant Pomologist*, and C. L. Dyer, *Scientific Assistant, Fruit-Improvement Investigations, Office of Horticultural and Pomological Investigations.*

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IMPORTANCE OF THE LEMON INDUSTRY.

In the United States, the lemon (*Citrus limonia* Osbeck) is grown commercially practically only in California. According to the Thirteenth Census of the United States there were 957,000 lemon trees of bearing age in the United States in 1910, and 396,000 under bearing age, of which 941,293, and 379,676, respectively, were in California. The total production of all States in 1909 was reported in the Thirteenth Census as amounting to 2,770,313 boxes, of which California produced 2,756,221 boxes.

Additional information concerning the lemon industry of California will be found in United States Department of Agriculture Bulletin 813, entitled "Citrus-Fruit Improvement: A Study of Bud Variation in the Eureka Lemon."

[1] This is the fifth in a series of bulletins summarizing the citrus-fruit improvement investigations of the Department of Agriculture. The four former reports, U. S. Dept. Agr. Buls. 623, 624, 697, and 813, presented the results of studies with the Washington Navel orange, the Valencia orange, the Marsh grapefruit, and the Eureka lemon, respectively.

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The Eureka variety of lemon is the one most widely grown in California. The Lisbon variety is extensively grown in certain districts, particularly near the coast. During the last few years large plantings of Lisbon lemons have been made in certain districts.

During the early period of the commercial lemon industry in California the Villa Franca variety was planted in some sections, but at the present time its propagation has been almost abandoned.

HISTORY OF THE LISBON LEMON VARIETY.

The Lisbon lemon was introduced into California from Australia. Two different lots of trees of this variety were imported about the same time.

In 1872 Mr. Ellwood Cooper, a pioneer horticulturist of Santa Barbara, Calif., noticed that the imported lemons in the San Francisco markets were superior in appearance and quality to those raised from the seedling trees in southern California. He then conceived the idea of importing budded trees of some good foreign variety and planting them in California instead of seedlings. He discussed the matter with Mr. Samuel P. Stow, a neighbor, of Goleta, Santa Barbara County, Calif., and they decided to make an importation of the Lisbon variety, which they learned was cultivated in Australia. Accordingly, Mr. Stow purchased 12 budded trees in that country and had them shipped to San Francisco. These trees died in transit and a second shipment was ordered. The trees in the second lot arrived in good condition in 1874. Mr. Stow retained two of them and sent the remainder to Mr. Thomas A. Garey at Los Angeles, who propagated and distributed many trees of this variety. The Lisbon lemon trees in some of the coast plantings in California can be traced to the Cooper-Stow introduction.[1]

In 1875 a small shipment of trees and plants, including some small Lisbon lemon trees, was received from Australia by Judge J. W. North, of Riverside, Calif. These trees were turned over to Mr. D. H. Burnham, a nurseryman of Riverside, who planted them and distributed trees propagated from them under the name Lisbon.[2]

Many of the plantings of the Lisbon lemon variety in Riverside County, San Bernardino County, and other interior lemon districts of southern California can be traced to the North-Burnham introduction. Later, other importations of budded Lisbon trees were made by nurserymen and orchardists, so that the variety as now grown in California is made up of a number of separate introductions.[3]

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[1] Entire statement from interview with Mr. Ellwood Cooper, Hotel Lankershim, Los Angeles, Calif., June 19, 1917.

[2] Personal statement of Mrs. Mary M. Burnham, widow of Mr. D. H. Burnham, Riverside, Calif., May 29, 1917.

[3] Letter from Mr. R. C. Allen, Bonita, Calif., Apr. 2, 1917.

VARIABILITY WITHIN THE VARIETY.

The systematic studies of the variations of the California citrus varieties were begun with the Washington Navel orange in 1909. Later, investigations were commenced with the Marsh grapefruit and Valencia orange. In June, 1911, the study of variations within the Eureka lemon variety was begun. This variety was found to be subject to variability in about the same degree as the citrus varieties previously studied.[1]

One year after beginning the study of the Eureka lemon, tree-census studies were begun with the Lisbon variety. It was found that this variety was subject to variability in about the same degree as the Eureka. In order to secure definite information on this subject individual-tree performance records were begun on a plat of trees of the Lisbon variety in June, 1913, included in which were typical trees of all the important strains discovered up to that time. In these studies detailed performance records have been obtained covering a total of 128 Lisbon lemon trees. The individual trees in these plats have been picked monthly as far as possible. As with the Eureka lemon studies, the frequent pickings during a period of several consecutive years have resulted in the accumulation of a very large mass of data and information, from which conclusions have been drawn as to strain and individual-tree characteristics.

In addition to these detailed studies, cooperative individual-tree performance records have been carried on in several California lemon orchards during this period with about 13,000 trees of the Lisbon variety.

The variability of the Lisbon lemon described in the discussion of the results of these studies must be clearly distinguished from the fluctuating variability due to climatic, soil, cultural, or other environmental influences. The variations considered in these studies are those which have been found to be transmitted by budding and are inherent variations. The fluctuating variations, such as modification of the size of the fruits, slight differences in the color of the leaves or fruits, or similar changes due to climatic conditions, cultural factors, or other causes, have not been taken into account except as indicating the effect of certain environmental factors in tree and fruit development. All of the variations considered in these studies have been traced to individual fruit or limb variations in trees growing under normal conditions.

OBJECTS OF THE INVESTIGATIONS.

The objects of these investigations have been to determine the frequency and importance of bud variation in the Lisbon variety of lemon; to ascertain the relative value for commercial orcharding of

[1] See U. S. Dept. of Agriculture Bul. 813, entitled "Citrus-Fruit Improvement: A Study of Bud Variation in the Eureka Lemon."

the various strains originating from bud variations; to discover methods for isolating the best and eliminating the inferior strains through bud selection; to originate and introduce methods for replacing trees of inferior strains in established orchards through top-working or replanting; to introduce methods for securing reliable supplies of buds from superior performance-record trees for use by propagators; and to establish a system of individual-tree record keeping in commercial lemon orchards, in order to locate the desirable and undesirable trees.

PLAN OF THE INVESTIGATIONS.

These investigations have been carried on by means of individual-tree performance records, as in the case of the citrus varieties previously studied. The term "performance record" is used to mean a systematic record for a period of several years of the yield and behavior of individual trees. This record includes notes of the amount, the commercial quality, and the variability and other important characteristics of the fruits produced by the individual trees. In the case of lemon trees, individual performance records for at least two consecutive and normal seasons on trees which have reached a full bearing age are considered necessary in order to determine the value of the trees for commercial fruit production. Similar records for at least four years are advisable, in order to furnish the basis for the selection of superior trees as sources of bud wood for propagation.

The same general methods of picking, handling, assorting, weighing, counting, and classifying the fruits that were described in detail in United States Department of Agriculture Bulletin 813, entitled "Citrus-Fruit Improvement: A Study of Bud Variation in the Eureka Lemon," were followed in the studies of the Lisbon lemon.

The conditions considered essential in the location of the Lisbon individual-tree performance-record plats were the same as those which determined the final location of similar record plats of other varieties, namely, (1) the production of successful and profitable crops of fruit; (2) location on virgin land in order to avoid any influence of previous cultural treatment; (3) protection from cold, strong winds, or other climatic causes of tree and fruit injuries; (4) the absence of radical pruning, rebudding, top-working, or other similar tree treatments; (5) freedom from or the effective control of diseases and insect pests; (6) uniform irrigation and cultural practices during the entire history of the orchard; (7) reliable information concerning the history of the buds used in the propagation of the trees and the kind of stocks; (8) the prospect of settled ownership for a period of years; and (9) the absence of apparent local environmental factors influencing tree behavior, so that the results of the individual-tree studies would be truly comparative.

The original plat included 113 trees. Later additional trees which represented important strains were added to this number in order to secure as complete information as possible concerning variability within the variety.

METHODS OF KEEPING PERFORMANCE RECORDS.

The same general methods of keeping performance records as those governing the work with the Eureka lemon were followed in the studies of variations in the Lisbon variety. These methods involve considerably more detailed observation than is usually considered necessary in commercial orchard practices. A method which has been adopted for commercial lemon-tree record keeping is described in Farmers' Bulletin 794, entitled "Citrus-Fruit Improvement: How to Secure and Use Tree-Performance Records."

Each of the trees in the performance-record plat was given an individual-tree number which consisted of three parts: (1) The number of the block in which the tree occurred; (2) the number of the row in the block, counting from some fixed point; and (3) the number of the tree in the row. This number was painted in a vertical position on the tree trunk. The fruits from each tree were picked at monthly intervals. The size of the fruit to be picked was determined by means of metal rings similar to those used by the regular picking crew in the orchard. While the size of the rings varied at different seasons of the year, no change was ever made during any one picking, so that the crops from the individual trees each month were comparable with each other. The fruit from each tree was kept separate, and the lemons after picking were assorted into three grades, namely, Green, Tree-Ripe, and Culls. The Green grade was made up of the valuable commercial fruits and included both dark and light green lemons; the Tree-Ripe grade was made up of mature or prematurely ripened fruits, which usually were of small size and thin rinds; and the fruits of the Cull grade were frequently extremely coarse or malformed. In addition, all lemons which dropped to the ground between picking periods were included in the Cull grade. The number and weights of the lemons in each grade were secured, and all variable fruits were sorted out and classified. One lemon of each grade was taken from the crop of each tree at each picking and the number of seeds counted. In the event that any samples of fruits of any grade were missing, so that the seeds could not be counted, a note of this fact was made in the field form by using the words "No count."

All the data obtained in the field were recorded in special field note forms. As soon as practicable after each picking these data were transferred to forms which provided for a maximum of twelve pickings, or the monthly pickings for one year. When the complete record for

an entire year had been obtained, it was transferred to a form having sufficient space for assembling the data of the individual tree for a period of several years. These performance-record forms, together with a more detailed account of the methods of compiling the records, are shown in United States Department of Agriculture Bulletin 813, entitled "Citrus-Fruit Improvement: A Study of Bud Variation in the Eureka Lemon."

DESCRIPTIONS OF THE IMPORTANT STRAINS.

LISBON STRAIN.

The Lisbon strain was originally called the Semidense Productive strain, on account of its habit of growth and productiveness. From the fact that the habit of growth of the trees and the characteristics of the fruits of this strain most nearly resemble the established ideal

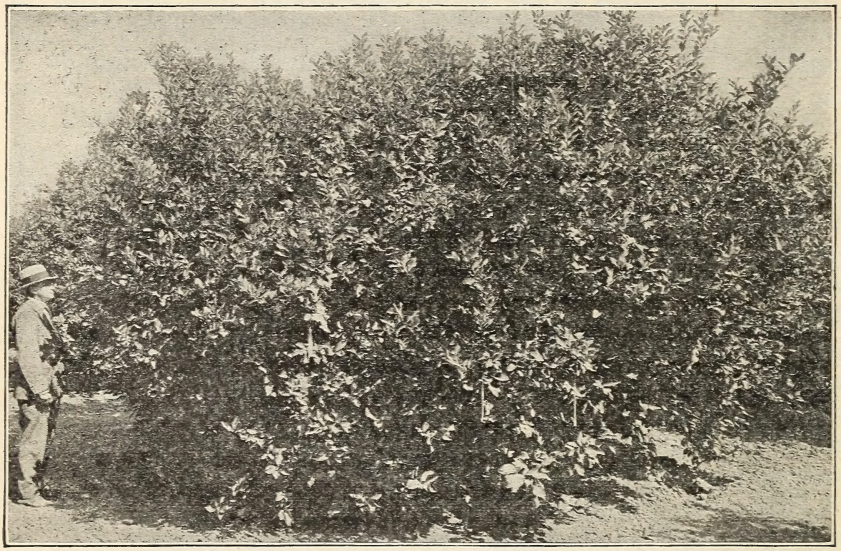


FIG. 1.—A typical lemon tree of the Lisbon strain (25 years old), No. 1-28-14 in the performance-record plat, showing the dense appearance of the foliage. The summarized record of this tree is presented in rank 23 in Table I.

for the Lisbon variety, it has been decided to call it the Lisbon strain. The trees of this strain are more productive than those of any other strain of the variety. The bulk of the crop reaches the necessary size for picking during the winter and spring seasons.

The habit of growth of the trees is spreading, as shown in figure 1, and more or less upright. The fruits are largely borne on the inside of the tree and are protected from climatic injuries by the covering of rather dense dark-green leaves. The leaves are of medium size, oval in shape, obtuse, slightly crenate, abundant, and from deep to dark green in color. The flowers are usually perfect.

The typical fruits, as shown in Plate I, are oblong oval in shape, of medium size, and of very smooth texture. The rag is tender, and the juice is abundant and of strong acidity. The fruits average about four seeds each, and the rinds are thin.

In addition to the characteristics noted in the foregoing paragraphs, it seems evident that the trees of this strain are more inherently hardy than those of the other Lisbon strains. They are usually more thorny than the trees of the Open strain, but the thorns are usually not very large or dangerous to the fruits. For certain conditions of soil and climate, such as locations where the trees are subjected to strong winds at certain seasons of the year or to long periods of hot sunshine, it seems likely that the trees of the Lisbon strain are preferable to those of the Open strain on account of the protection afforded the fruits by the dense foliage and the resistance of the trees to unfavorable environmental conditions.

OPEN STRAIN.

The name of this strain was adopted because it describes the habit of growth of the trees, which is one of its most easily identified characteristics. The trees of the Open strain were more numerous than those of any other strain in the performance-record plat. In near-by orchards the proportion of trees of this strain was found to be much smaller than in the performance-record plats, and the leading strain was the Lisbon. In other Lisbon orchards in several important districts most of the trees in the orchards were found to belong to the Open strain. In certain districts the Lisbon strain is most commonly found, while in others the Open strain predominates.

It has seemed likely that the trees included in this strain really represent two rather distinct strains, the trees of one being very much more productive than the other. However, for the purposes of this study the two classes of trees have been brought together under one head and considered as belonging to one strain.

The trees produce fruits during all seasons of the year under normal conditions, resembling in this respect the trees of the Eureka strain of the Eureka lemon variety. As shown in figure 2, they have an open and somewhat drooping habit of growth. The leaves are of medium size, ovate in shape, obtuse, slightly crenate, rather few in number, and are of a deep-green color. The flowers are usually perfect.

The typical fruits, as illustrated in Plate II, are oval to oblong in shape and of medium size; the rinds are thin and of smooth texture; the rag is tender; and the juice is abundant and of strong acidity. The average number of seeds found in the fruits of this strain in the performance-record plats was five.

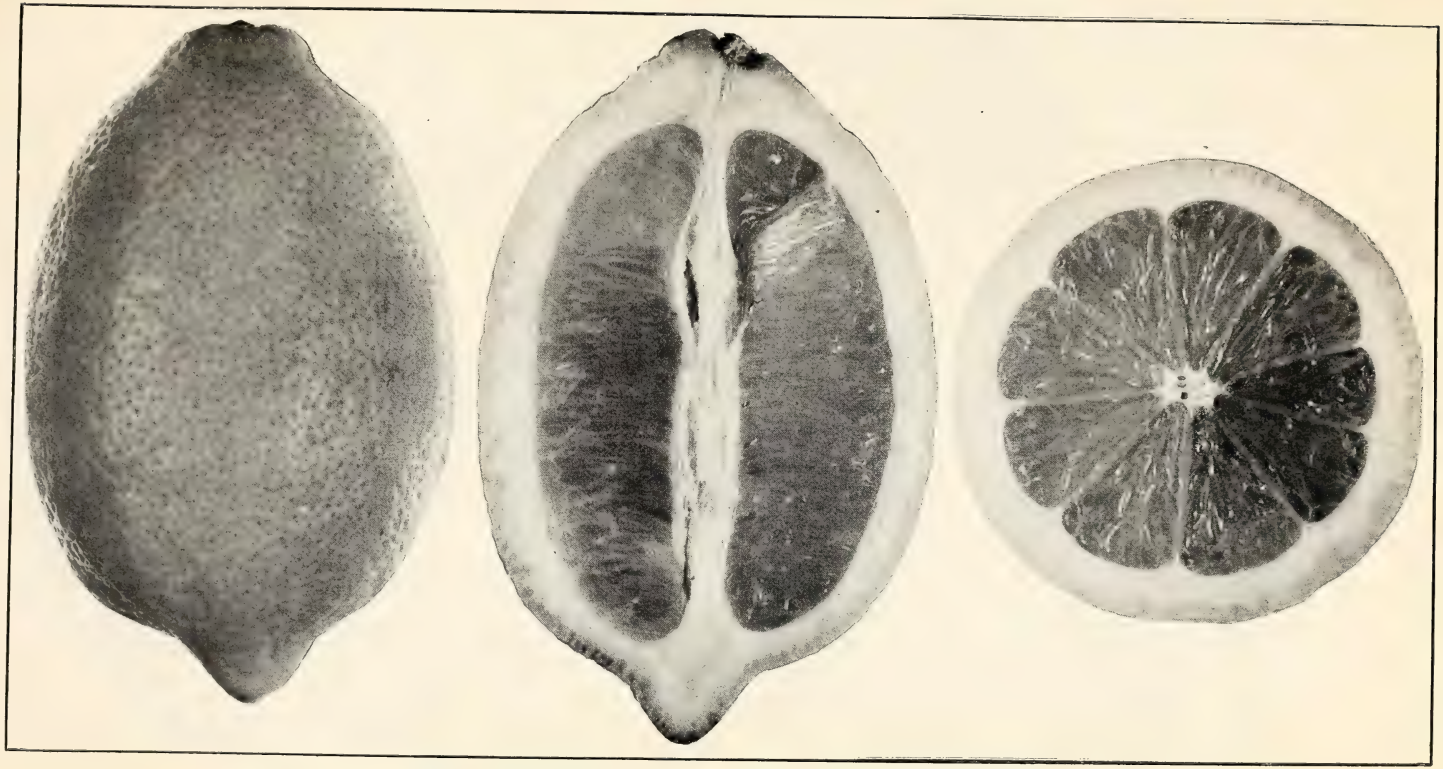
The importance of the Open strain lies in its tendency to fruitfulness during all seasons of the year under normal conditions. In this respect it is more desirable than the Lisbon strain. The trees have not been as productive as those of the Lisbon strain and have not shown as great resistance to unfavorable climatic conditions, such as low temperature or extreme heat, as the trees of the Lisbon strain.

FIG. 2.—A typical lemon tree (25 years old) of the Open strain of the Lisbon variety, No. 1-34-11 in the performance-record plat, showing the open habit of growth characteristic of the trees of this strain. The summarized record of this tree is presented in rank 64 in Table I.

Therefore, it seems probable that the Open strain is better adapted to those sections where the climatic conditions are most moderate, as is the case in lemon districts near the coast. The Lisbon strain is probably best adapted to interior districts where extremes of heat and cold are more likely to occur.

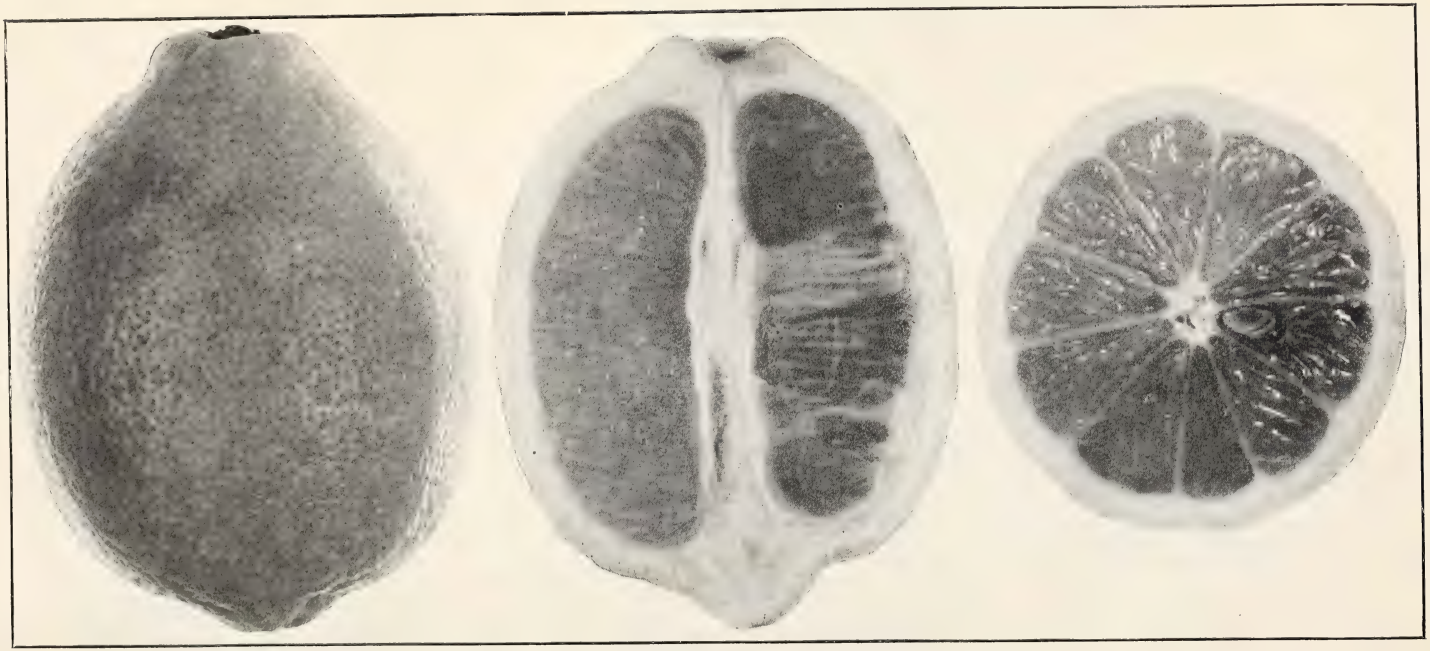
DENSE-UNPRODUCTIVE STRAIN.

The trees of the Dense-Unproductive strain show very vigorous vegetative growth. They bear large, pointed leaves and coarse fruits having thick rinds and a comparatively small quantity of juice. The proportion of trees of this strain in different Lisbon groves varies greatly. In some unproductive orchards most of the trees belong to this strain. The desirability of eliminating this strain in established orchards or in new propagations is emphasized not only from the standpoint of low production, but equally, if not more important, on account of the production of coarse, inferior fruits, which are likely to be very injurious to the reputation of California lemons.



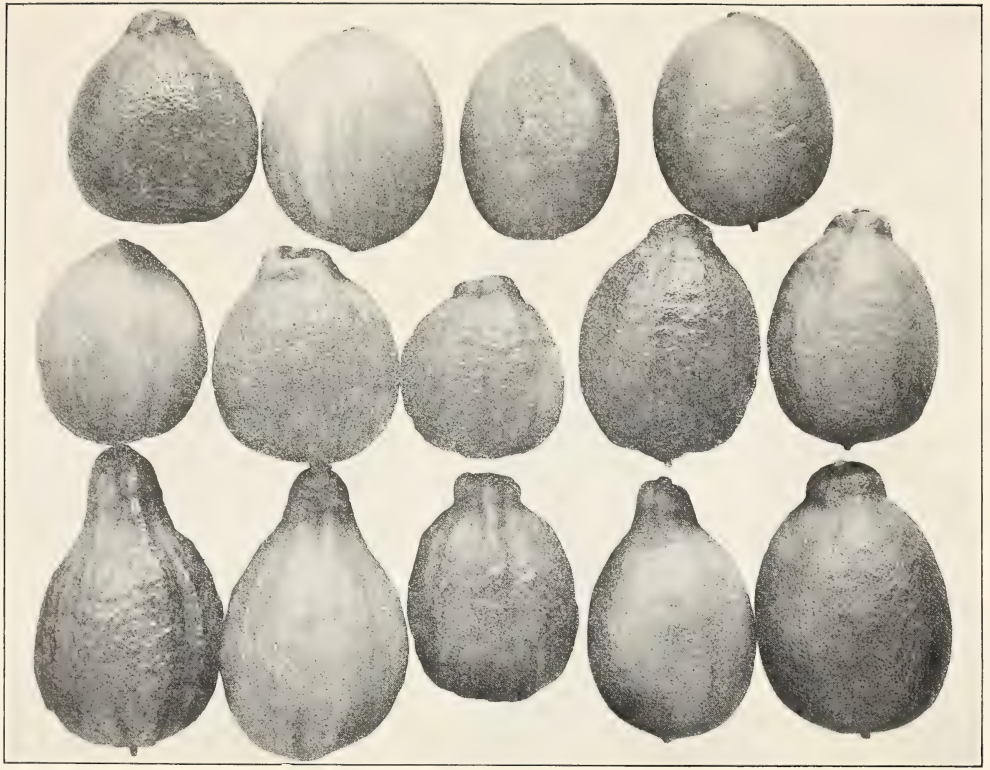
TYPICAL FRUITS OF THE LISBON STRAIN OF THE LISBON LEMON.

Natural size.



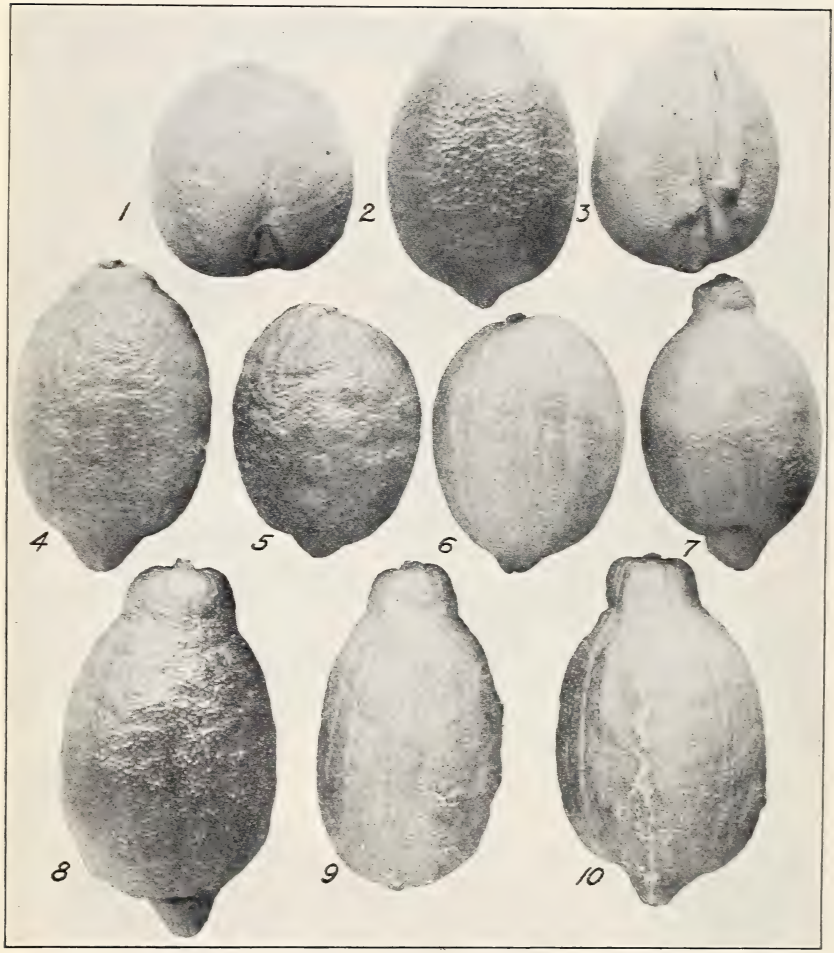
TYPICAL FRUITS OF THE OPEN STRAIN OF THE LISBON LEMON.

Nearly natural size. The fruit in center is 3¼ inches long.



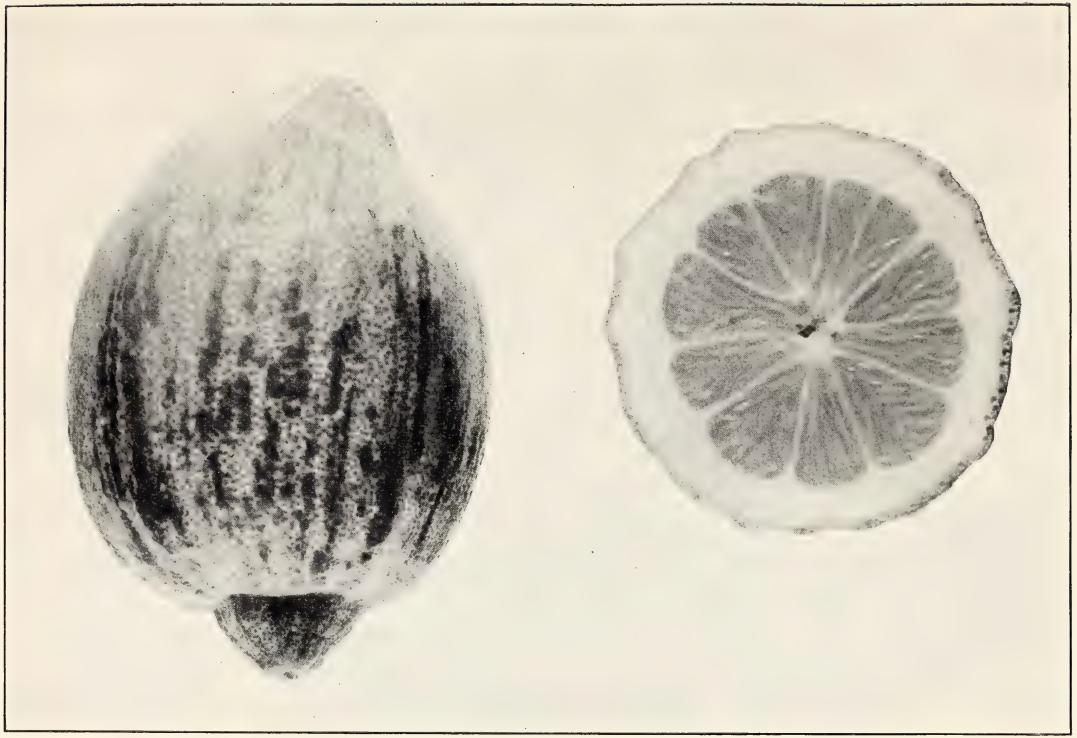
TYPICAL FRUITS FROM A TREE OF THE DENSE-UNPRODUCTIVE STRAIN OF THE LISBON LEMON.

The coarse texture and undesirable shapes of the fruits of this strain are clearly shown. Three-sevenths natural size. The natural size of the fruit at the right end of the center row is 3 inches long.



TYPICAL FRUITS FROM A TREE OF THE BULL STRAIN OF THE LISBON LEMON.

Several variations and at least one mutation are shown: 1, Rounded, split end; 2, coarse, Lisbonlike; 3, creased; 4, Lisbonlike; 5, finely corrugated; 6, variegated; 7 and 8, normal Bull strain, collared and protruding; 9, collared and variegated; 10, collared, protruding and variegated. About three-sevenths natural size. The natural size of the fruit at the upper right hand is 3 inches long.

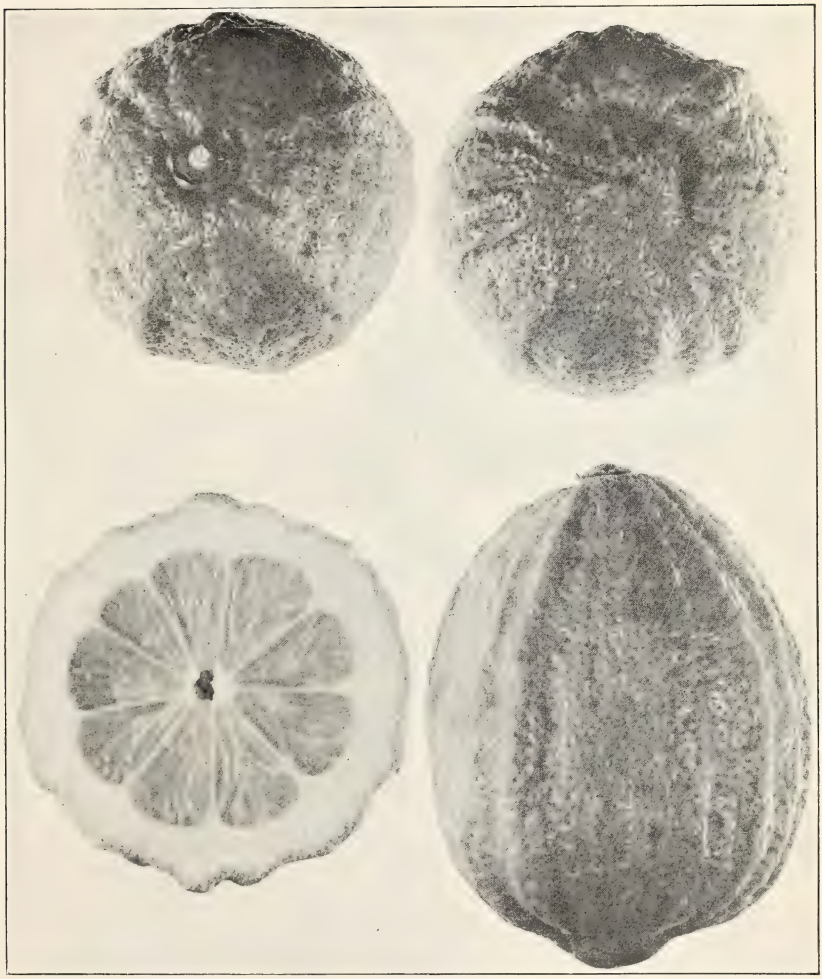


TYPICAL FRUITS OF THE VARIEGATED STRAIN OF THE LISBON VARIETY.

The fruits, leaves, and limbs of the trees of this strain are striped and the surface of the rind is slightly ridged. Natural size.

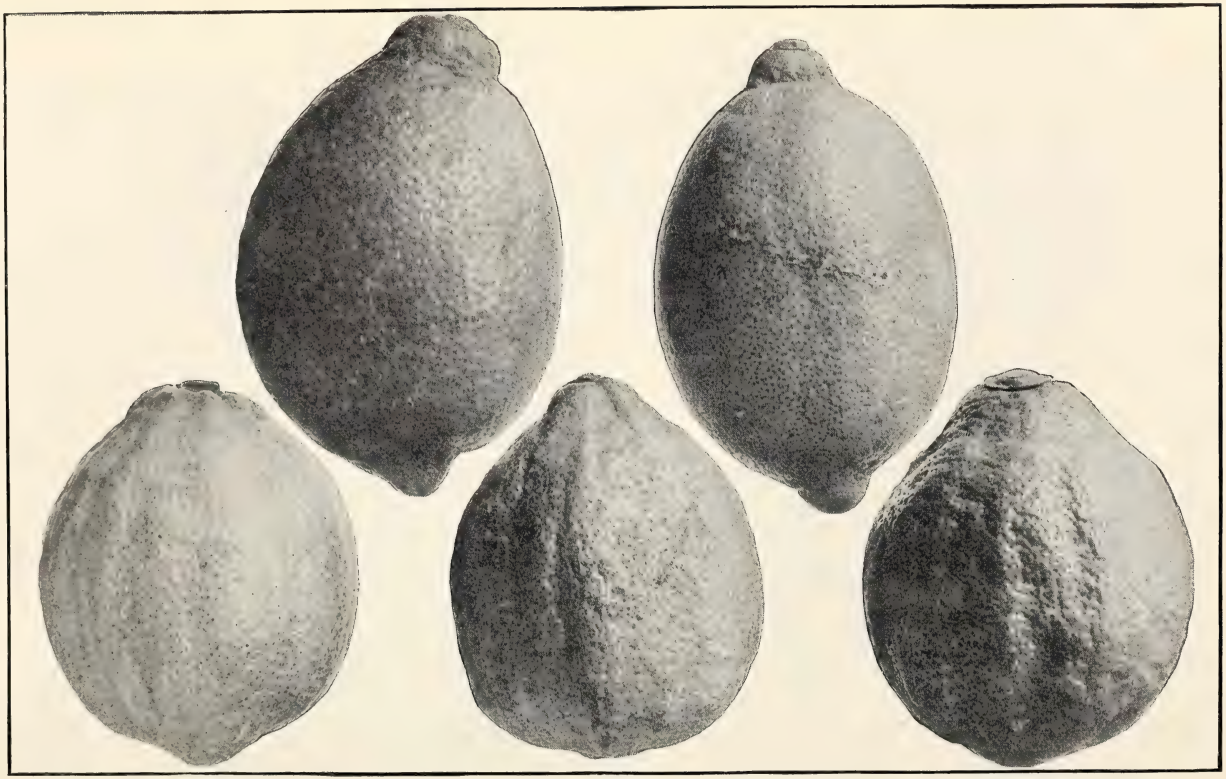
TYPICAL FRUITS FROM A TREE OF THE SPORTING STRAIN OF THE LISBON LEMON.

The variation in shape, texture, ridging, and development of stem and blossom ends are shown: 1, Slightly collared; 2, protruding blossom end; 3, collared; 4, uniformly creased; 5, raised ridge and collared; 6, bottle shape; 7, ridged and collared; 8, creased. Most of these fruits have little or no commercial value. About three-fifths natural size. The fruit at the upper left hand is 2¾ inches long.



TYPICAL FRUITS OF A CORRUGATED VARIATION FOUND ON A TREE OF THE OPEN STRAIN OF THE LISBON LEMON.

This variation has been frequently found as individual fruit, limb, and entire tree bud sports. The fruits are commercially worthless, but are interesting as throwing light on the origin of lemon strains from bud variations. Nearly natural size. The fruit at the lower right hand is $2\frac{7}{8}$ inches long.



TWO VARIATIONS FOUND ON SEPARATE BRANCHES OF A LEMON TREE ON WHICH ALL THE OTHER FRUITS WERE OF THE LISBON STRAIN.

About four-fifths natural size. The fruit at the upper right hand is 3¼ inches long.

The trees bear low yields of inferior crops, mostly during the late-fall and early-winter seasons. They have a spreading habit of growth and attain great size unless pruned vigorously. They develop a large number of vigorous-growing, upright, vegetative branches, or suckers.

The leaves are large and sharply pointed. They develop abundantly, making dense-appearing trees, and their normal color is deep green. The flowers are often imperfect, the pistil being small or rudimentary. The pollen is frequently scant and of low vitality. The thorns are abundant and often very large, long, and sharply pointed and have been found to be responsible for injuries to the fruits which in many cases lead to decay and loss to the growers.

The fruits, as shown in Plate III, are somewhat oblong, usually collared, and blunt or flattened at the blossom end. The rinds are thick, coarse, and rough in texture and are more or less ridged. The rag is tough and abundant, and the juice is scant and of low acidity and poor quality. The seeds average between one and two to a fruit.

The reputation for extreme thorniness of the Lisbon variety in most cases is due to the many thorns developed by the trees of this strain. It also seems likely that the decay sometimes observed in Lisbon lemons is due to the thorn injuries to the fruits borne by the trees of this and the Bull strain. This condition serves to emphasize the desirability of eliminating these strains and planting only trees of the Lisbon or Open strain, which have relatively few thorns.

BULL STRAIN.

The name of this strain was adopted because the word Bull is in common use among Lisbon lemon growers for certain rank-growing undesirable trees. These trees show very vigorous vegetative growth and have large, sharply pointed, light-green leaves. They produce coarse fruits with thick rinds and little juice, which is of poor quality. This strain is one which should be eliminated in all established orchards. It should not be propagated for any commercial purpose. In many established orchards many trees of the Bull strain have been recently top-worked successfully with buds from carefully selected trees of the Lisbon or Open strains. A very noticeable improvement in the commercial grade of fruit has followed the elimination of the trees of the Bull strain in those orchards.

The trees bear comparatively heavy crops during the winter. They have a spreading habit of growth and unless restrained by heavy pruning attain great size. They develop many large upright-growing suckers formerly highly prized as bud wood for propagation. The pointed leaves are large and very abundant, so as to make dense-appearing trees, and their color is usually light green. The thorns are large and abundant and are frequently very long and sharply

pointed. They are responsible for many injuries to the fruit, particularly during periods of strong winds.

The typical fruits, as shown in Plate IV, are oblong in shape and likely to be ridged or malformed. The rinds are usually very thick, and coarse and rough in texture; the rag is abundant and tough; the juice is scant and lacks acidity and flavor. The fruits, which have an average of about four seeds, grow very rapidly, and when picked with the normal interval between pickings are much larger than those of other strains.

The comparatively heavy production of the trees of the Bull strain has made some growers hesitate to eliminate them. The fruits are poor, and when included in the regular pack frequently depreciate the value of the crops in which they occur. From the observations on the value of trees of the Bull strain and their fruits, it can be safely recommended that all such trees be top-worked or replaced with trees of the desirable strains.

VARIEGATED STRAIN.

Other strains of the Lisbon variety than those described in this bulletin have been observed but have not been studied fully as yet. Among these additional variations the Variegated strain is particularly interesting, occurring rather frequently in some Lisbon orchards. A typical example of a fruit of the Variegated strain is shown in Plate V. The trees and fruits are similar in appearance and have very much the same characteristics as those of the Variegated strain of the Eureka variety.

SPORTING STRAIN.

The trees of the Sporting strain of the Lisbon variety resemble in their condition of variability the Sporting trees of the Eureka variety. They contain branches bearing fruits typical of all the strains so far observed in the Lisbon variety, together with other variations not classified as strains in these studies. One of the most common of these minor variations found in the trees of the Sporting strain is a bell-shaped fruit, usually deeply ribbed or fluted in appearance. This variation is shown in Plate VI, figure 7. This and the other forms shown in the same illustration were found on a lemon tree grown from a single bud. Other variations of frequent occurrence are uniformly ridged fruits. This condition gives the fruits the appearance of fine corrugations, as shown in Plate VII. Entire trees bearing both the bell-shaped ribbed fruits and the corrugated-appearing fruits have been observed in the orchards in which the performance records have been obtained. In the trees in the performance-record plats, however, only single fruit or branch variations having these characteristics have been found.

The trees of the Sporting strain vary in size, habit of growth, and productiveness according to the character of the variations borne by them.

LESSONS TAUGHT BY THESE INVESTIGATIONS.

As in the case of the other lemon variety, the performance-record studies of the Lisbon trees have been particularly interesting, for the reason that the frequent pickings have made possible the almost continuous systematic observation of individual-tree behavior throughout the entire year. A very large number of buds taken from superior trees of both the Lisbon and Open strains in the performance-record plats have been furnished to propagators. These buds from individual parent trees have been kept separate, so that each progeny can be traced back at any time from the orchard planting to the parent trees. In addition to these buds which have been cut from the best of performance-record trees, buds have also been taken from the poorest trees, in order to compare under orchard conditions the behavior of the progenies of the most desirable with those from the undesirable parent trees.

The early fruiting of the young trees propagated from select parent trees is just as marked in the Lisbon as in the Eureka variety; in fact, it is even more striking in the Lisbon variety, as it was formerly thought that trees of the Lisbon strain were slow in coming into production. Experimental propagations from productive parent trees of this strain in the performance-record plat have shown that young trees of this strain come into fruiting very early. Within some of the strains marked variations of importance commercially were found, but none as striking as the variations which distinguish the strains themselves. These individual-tree differences within the strains should be taken into account by the performance-record keeper and the knowledge of these variations utilized in the selection of trees for top-working or for use as sources of bud wood.

There is a marked correlation between the quantity and quality of the fruits produced by the individual trees of the different strains in the Lisbon variety. A similar correlation was found in the studies of the individual-tree production of the various strains of the Eureka lemon, the Washington Navel orange, the Valencia orange, and the Marsh grapefruit. The trees bearing the most lemons usually produce the best commercial fruits. Usually the most productive trees show the fewest marked variations in fruits from the type of the strain to which they belong. This condition makes the securing of production records especially valuable, in that it enables the grower to secure a reliable conception of the fruits of the individual trees.

PRESENTATION OF DATA.

The diagrams and tables presented herewith in summarizing the studies on the Lisbon lemon variety have been prepared from individual-tree performance records of 128 trees located in a 100-acre orchard near Corona, Calif., which was planted in 1893. Only a few crops of winter barley had been grown on the property prior to that time. Records were begun on 113 of these trees in July, 1913. Two months later, one of the trees adjoining this block was found to be of the Sporting strain, and it was included in the record plat. Because of the small crops borne by the tree at that season, its record for that year has been summarized as though the 12 months were represented. An additional block of 14 trees, among them being several representatives of the Bull strain, was added to the plat in July, 1914.

The orchard where these trees were located was protected by orchard heaters from the frosts of the winter of 1912-13, and very little injury occurred to the trees or fruit. The excessive number of fruits of the Cull grade recorded in October, 1913, and to some extent in December, were put in that grade because they showed slight injury from the frosts of the previous winter. Performance records were secured on the Lisbon plat continuously from the time of its establishment until June, 1917, inclusive, a 4-year period for the 114 trees first selected and a 3-year period for the remaining 14 trees. Seven trees of the Open strain near the center of the original plat became badly diseased in 1915 and were given a severe pruning and other treatment to restore them to normal production. On this account these trees have been omitted in summarizing the records presented herewith.

Included in the 121 trees for which records are presented are representatives of the five Lisbon strains, as follows: Lisbon, 22; Open, 77; Bull, 11; Dense Unproductive, 8; and Sporting, 3.

The average annual crop of each of the 121 trees in the investigational plat of Lisbon lemons is shown in Table I, which also shows the percentage (by weight) of green fruits produced, the percentage (by number) of variable fruits, and the average number of seeds per fruit for each of the trees. The trees are listed in this table in the order of their average annual production by weight. The trees of the Bull strain are large and vigorous growing and produce heavy crops, but their fruit is coarse, thick skinned, and much less desirable than that borne by the trees of the Lisbon strain. The trees of the Sporting strain may bear heavy or light crops, but because of the variable character of the fruit those trees are very undesirable, from the standpoint of both the producer and the propagator. It is interesting to note that Table I shows that 18 of the 22 trees of the Lisbon strain occurring in this plat averaged heavier crops than any other trees except some of those of the Bull and Sporting strains.

TABLE I.—*Summarized statement of the average annual production of 121 individual lemon trees of the Lisbon variety for which detailed performance records were obtained for the 4-year period from July, 1913, to June, 1917, inclusive.*

[Detailed performance records of the trees marked with an asterisk (*) are shown in Table II. The trees marked with a dagger (†) were added to the plat in July, 1914; hence the data shown for them are based on records for the 3-year period from July, 1914, to June, 1917, inclusive. Records of the number of seeds per fruit cover the 3-year period from July, 1914, to June, 1917, inclusive.]

Rank.	Strain.	Tree designation.	Average annual crop production.				Seeds per fruit.
			Weight.	Number.	Green grade.	Variable fruits.	
			Pounds.		*Per cent.*	*Per cent.*	
1	Lisbon	*1-27-10	736.47	2,897.00	80.5	36.7	4.36
2	do	1-27-11	708.63	2,788.25	79.6	37.4	5.42
3	do	1-26-11	700.70	2,668.00	84.0	41.9	4.56
4	do	1-28- 8	700.19	2,701.50	84.0	38.7	5.34
5	Bull	*†1-56-15	694.65	2,527.67	89.6	43.3	5.05
6	Lisbon	*1-26- 8	690.80	2,586.25	86.6	39.2	4.06
7	Bull	†1-56-12	678.75	2,459.33	89.4	56.3	4.44
8	Lisbon	1-28-10	676.28	2,596.00	84.4	39.2	4.69
9	Bull	†1-57-17	669.08	2,465.00	88.8	51.7	4.65
10	do	*†1-56-14	665.92	2,451.33	90.1	42.7	4.08
11	Lisbon	1-35- 9	665.63	2,742.75	64.3	19.4	6.77
12	do	1-27-16	657.73	2,530.50	85.3	33.4	4.63
13	do	*1-27- 9	657.06	2,600.00	79.1	36.2	5.32
14	do	1-27-14	656.73	2,475.00	87.2	34.9	5.87
15	do	1-26-17	655.08	2,553.25	82.4	31.7	5.51
16	do	1-27-17	654.55	2,494.50	86.8	37.4	1.43
17	do	*1-29-17	644.41	2,463.00	87.6	39.3	2.14
18	do	1-29-16	641.44	2,454.00	88.1	41.2	1.70
19	Bull	†1-56-17	640.44	2,345.33	90.2	48.6	3.85
20	do	†1-57-14	640.17	2,373.33	90.9	47.9	4.21
21	Lisbon	1-26-16	634.88	2,445.75	86.4	40.8	3.76
22	Sporting	*1-25-10	619.48	2,374.50	83.9	50.6	3.38
23	Lisbon	1-28-14	615.73	2,345.25	84.9	35.4	4.24
24	Bull	*†1-57-16	614.52	2,264.67	87.7	44.9	5.20
25	do	†1-56-13	608.81	2,195.67	91.9	41.5	4.63
26	Lisbon	*1-28-17	604.84	2,292.50	87.4	32.8	2.13
27	Bull	†1-57-13	603.23	2,201.00	90.3	43.9	4.38
28	Lisbon	1-35-14	593.38	2,520.25	63.8	16.2	8.20
29	Open	*1-32-10	590.20	2,370.25	72.0	19.9	4.65
30	do	1-29-15	588.69	2,360.75	73.0	24.0	4.56
31	Lisbon	1-28-16	587.88	2,261.50	88.0	37.4	1.82
32	Bull	†1-57-11	586.33	2,134.67	91.2	50.1	2.98
33	Open	1-31-11	581.47	2,405.00	71.2	21.0	4.50
34	do	1-31-17	579.72	2,443.25	63.1	19.5	4.82
35	do	1-29-13	577.36	2,339.50	71.0	21.6	4.57
36	do	1-32-11	575.30	2,344.00	69.6	17.9	5.34
37	do	1-31- 8	570.52	2,286.00	72.3	21.6	4.87
38	do	1-33- 8	566.95	2,293.50	67.9	20.4	5.53
39	do	*1-29-14	554.88	2,244.25	70.9	22.2	5.25
40	do	1-26-13	551.48	2,204.50	75.3	22.3	4.70
41	Sporting	†1-56-11	551.19	2,011.00	90.5	42.3	2.75
42	Open	1-26-10	550.08	2,223.50	72.4	23.9	4.14
43	Lisbon	1-26-18	549.23	2,181.25	78.0	30.3	6.10
44	Open	1-31-18	542.83	2,266.25	66.2	20.6	4.11
45	do	1-33-18	539.61	2,290.25	64.4	19.3	5.43
46	Lisbon	1-27-15	538.80	2,114.50	78.8	32.4	3.98
47	Open	1-33- 9	536.91	2,257.50	64.3	15.9	5.54
48	do	1-34- 9	536.31	2,217.50	64.2	16.9	5.18
49	do	1-32- 9	536.00	2,244.25	67.2	18.0	5.41
50	do	*1-33-17	533.88	2,242.25	66.9	19.5	4.94
51	do	1-32- 8	533.84	2,140.00	72.2	21.3	4.40
52	do	1-33-14	531.34	2,184.50	67.8	24.6	5.37
53	do	1-32-18	528.38	2,225.25	62.9	15.9	5.00
54	do	1-31-16	527.42	2,228.75	64.0	15.8	5.21
55	do	1-31-10	526.36	2,158.00	70.1	18.9	4.79
56	do	1-26- 9	526.27	2,156.75	68.3	21.8	4.30
57	Bull	*†1-57-12	524.85	1,967.67	86.5	48.0	3.15
58	Open	1-32-16	523.27	2,259.25	61.2	14.7	5.35
59	do	*1-29-10	522.48	2,102.25	70.1	21.6	4.33
60	do	1-31- 9	522.22	2,128.25	71.4	21.8	5.21
61	do	1-34-18	517.41	2,171.25	61.8	15.6	4.98
62	do	1-34-13	516.84	2,234.75	56.6	13.0	5.09
63	do	1-31-12	515.92	2,137.25	67.6	17.9	4.91
64	do	1-34-11	515.36	2,237.00	59.4	14.8	5.74
65	do	1-33-11	506.86	2,102.25	63.1	19.5	4.82
66	do	1-30- 8	502.98	2,033.50	65.8	19.4	4.27
67	do	*1-33-10	502.45	2,114.00	62.3	16.1	4.60

TABLE I.—*Summarized statement of the average annual production of 121 individual lemon trees of the Lisbon variety for which detailed performance records were obtained for the 4-year period from July, 1913, to June, 1917, inclusive*—Continued.

[Detailed performance records of the trees marked with an asterisk (*) are shown in Table II. The trees marked with a dagger (†) were added to the plat in July, 1914; hence the data shown for them are based on records for the 3-year period from July, 1914, to June, 1917, inclusive. Records of the number of seeds per fruit cover the 3-year period from July, 1914, to June, 1917, inclusive.]

Rank.	Strain.	Tree designation.	Average annual crop production.				Seeds per fruit.
			Weight.	Number.	Green grade.	Variable fruits.	
			Pounds.		*Per cent.*	*Per cent.*	
68	Open	1-30-15	501.28	2,121.25	63.0	18.6	5.07
69	do	1-34- 8	500.69	2,114.00	63.2	15.4	5.18
70	do	1-30-13	497.14	2,049.25	68.0	23.4	4.15
71	do	1-26-14	496.86	2,013.75	70.2	19.9	5.03
72	do	1-27-12	496.64	2,052.50	68.8	13.7	4.58
73	do	1-33-12	493.63	2,061.75	64.5	19.5	4.96
74	do	1-26-12	492.67	1,997.25	74.6	20.7	4.84
75	do	*1-30-11	480.17	2,022.50	66.7	17.2	4.71
76	Lisbon	*1-27- 8	479.33	1,914.75	73.1	20.2	4.58
77	Open	1-34-10	475.09	1,976.00	64.1	18.3	5.54
78	do	1-35-11	474.38	2,084.50	52.6	10.0	6.31
79	do	1-34-16	472.19	2,043.00	57.7	15.0	5.21
80	do	1-34-15	466.09	2,159.25	52.1	14.4	4.93
81	Sporting	*1-83-10	462.52	1,712.75	85.6	47.7	3.03
82	Open	1-32-17	461.97	1,962.25	59.7	18.5	5.12
83	do	1-30-17	459.39	1,923.50	64.2	20.4	5.07
84	do	1-30-14	459.28	1,967.50	60.9	21.9	5.04
85	do	*1-35-10	457.78	1,930.50	68.4	25.6	4.74
86	do	1-28-15	455.20	1,913.50	68.7	22.8	4.45
87	do	1-30-16	453.48	1,908.25	63.0	20.2	4.93
88	do	1-27-13	450.83	1,856.25	69.6	21.6	5.05
89	do	1-30-18	447.53	1,892.25	63.9	20.4	4.26
90	do	1-34-17	443.52	1,911.50	58.9	18.6	5.06
91	do	1-28-12	441.86	1,851.50	66.4	22.5	4.63
92	do	1-33-13	437.95	1,877.00	62.2	19.7	5.38
93	do	*1-34-12	437.08	1,877.25	58.5	18.8	5.09
94	do	1-28-18	436.19	1,836.50	65.1	20.0	5.17
95	do	1-26-15	428.78	1,805.00	67.1	20.7	5.11
96	do	1-34-14	425.84	1,820.00	59.0	16.3	5.05
97	do	1-29-18	424.72	1,777.00	66.5	24.8	4.57
98	do	1-28-11	424.42	1,788.75	67.3	19.6	4.54
99	do	1-28-13	410.09	1,757.00	67.8	17.8	4.41
100	do	1-35-17	405.69	1,813.75	50.5	10.2	5.90
101	do	*1-35-12	398.53	1,814.00	43.4	9.6	6.82
102	do	1-28- 9	395.94	1,703.50	64.6	22.5	4.79
103	do	†1-56-16	386.79	1,584.00	61.8	32.2	5.11
104	do	1-27-18	383.73	1,687.50	63.4	21.7	4.81
105	do	1-33-15	383.05	1,647.00	60.4	20.5	5.43
106	do	1-35-13	382.64	1,738.25	46.0	12.0	6.77
107	do	1-35-16	377.81	1,692.00	49.2	9.4	6.23
108	do	†1-57-15	376.35	1,526.00	65.9	33.7	5.30
109	do	1-35-18	369.55	1,613.25	51.8	11.5	6.22
110	do	1-35-10	362.97	1,564.00	54.9	16.2	6.10
111	do	1-35- 8	350.38	1,566.75	49.0	8.9	6.46
112	do	1-33-16	344.64	1,464.25	61.1	19.5	4.39
113	do	*1-35-15	336.78	1,531.00	45.9	11.3	6.67
114	Dense Unproductive	*1-29-11	281.81	1,050.25	92.2	70.4	1.38
115	do	1-30- 7	231.14	876.00	89.5	73.9	1.44
116	do	1-29- 8	223.36	853.00	91.8	71.3	2.05
117	do	*1-29-12	217.58	834.00	90.4	73.4	1.55
118	do	1-29- 7	212.56	793.50	94.2	71.5	1.74
119	do	1-29- 9	204.22	789.50	89.7	75.1	1.63
120	do	1-30- 9	195.61	757.75	88.7	73.4	1.25
121	do	*1-30-12	159.75	628.75	85.8	68.9	2.29

Figure 3 shows graphically the variations of the average annual crops of the individual Lisbon trees, showing the total crops and the proportions of fruit of the Green, Tree-Ripe, and Cull grades for each tree. The trees are listed from left to right in the same order as in Table I.

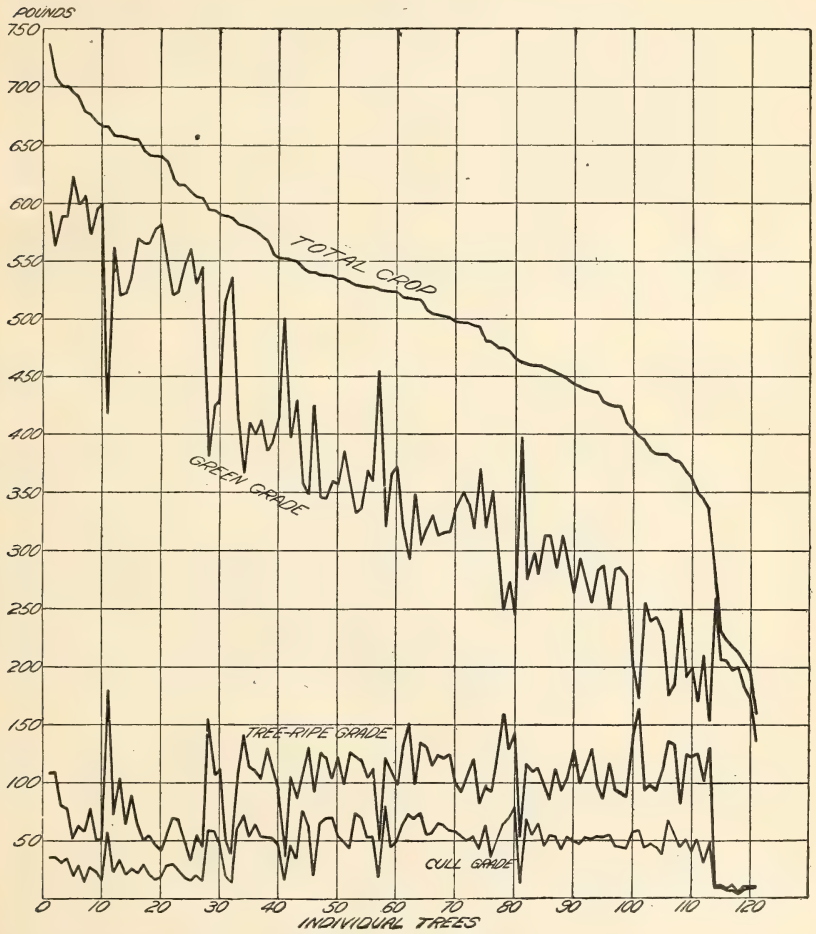


FIG. 3.—Diagram showing the average annual total crop of Lisbon lemons and the production by the three commercial grades from the individual trees in the investigational performance-record plat during the 4-year period from July, 1913, to June, 1917, inclusive. The data for 14 trees, as noted in Table I, cover only the 3-year period from July, 1914, to June, 1917, inclusive.

Table II shows the relative positions of the individual trees in the Lisbon investigational plat. The strain to which each tree belongs is indicated and its rank by production as listed in Table I. This illustrates the distribution in the plat of the trees of the different ranks and strains.

In Tables III and IV are presented the detailed performance records of 25 representative trees from the Lisbon investigational plat, including examples of all the strains. These trees were arbitrarily selected by taking every fourth tree of the Lisbon strain, as listed in Table I, every eighth tree of the Open strain, every third tree of the Bull and Dense-Unproductive strains, and two of the three trees of the Sporting strain, always including the highest and lowest ranking trees of each strain. In this way the selection included 6 trees of the Lisbon strain, 10 of the Open strain, 4 of the Bull strain, 3 of the Dense-Unproductive strain, and 2 of the Sporting strain.

TABLE II.—*Distribution of lemon trees of the Lisbon variety in the investigational performance-record plat, showing also the strain and the rank in crop production of each individual tree for the 4-year period from July, 1913, to June, 1917, inclusive.*

[The positions of trees in ranks 22 and 81 are not indicated in the table. They were both No. 10 in rows 25 and 83, respectively, both belonging to the Sporting strain. The tree numbers count from the southern end, which is taken as the head of the row. Explanation of symbols: ⊙=Lisbon strain, □=Bull strain, ●=Open strain, △=Dense-Unproductive strain, ⊡=Sporting strain, ×=not included in records.]

Serial No. of the tree in the row.	Number of row																					
	35		34		33		32		31		30		29		28		27		26		56		57	
	Strain.	Rank.	Strain.	Rank.	Strain.	Rank.	Strain.	Rank.	Strain.	Rank.	Strain.	Rank.	Strain.	Rank.	Strain.	Rank.	Strain.	Rank.	Strain.	Rank.	Strain.	Rank.	Strain.	Rank.
7	...	...	...	...	...	...	...	...	...	...	△	115	△	118	...	...	...	...	...	...	...	...	...	...
8	●	111	●	69	●	38	●	51	●	37	●	66	△	116	⊙	4	⊙	76	⊙	6	...	...	...	...
9	⊙	11	●	48	●	47	●	49	●	60	△	120	△	119	●	102	⊙	13	●	56	...	...	...	...
10	●	110	●	77	●	67	●	29	●	55	●	85	●	59	⊙	8	⊙	1	●	42	...	...	...	...
11	●	78	●	64	●	65	●	36	●	33	●	75	△	114	●	98	⊙	2	⊙	3	⊡	41	□	32
12	●	101	●	93	●	73	×	...	●	63	△	121	△	117	●	91	●	72	●	74	□	7	□	57
13	●	106	●	62	●	92	×	...	×	...	●	70	●	35	●	99	●	88	●	40	□	25	□	27
14	⊙	28	●	96	●	52	×	...	×	...	●	84	●	39	⊙	23	⊙	14	●	71	□	10	□	20
15	●	113	●	80	●	105	×	...	×	...	●	68	●	30	●	86	⊙	46	●	95	□	5	●	108
16	●	107	●	79	●	112	●	58	●	54	●	87	⊙	18	⊙	31	⊙	12	⊙	21	●	103	□	24
17	●	100	●	90	●	50	●	82	●	34	●	83	⊙	17	⊙	26	⊙	16	⊙	15	□	19	□	9
18	●	109	●	61	●	45	●	53	●	44	●	89	●	97	●	94	●	104	⊙	43	...	...	...	...

The following notes regarding some of the methods of recording and compiling the data presented in Table III may assist the reader to understand and interpret it.

Commercial performance records were not being obtained on the orchard in which this plat was located, and the workmen were unacquainted with such operations. Consequently on a few occasions the fruit from some of the performance-record trees was removed by the regular workers in the grove before the records were made. Fortunately the most of such losses occurred in the summer or fall when the production was light and the total recorded crops were not greatly affected thereby, but the record for tree 1–83–10 is considerably reduced by similar losses in January and February, 1914, at which time the production was very heavy. At least 200 pounds of fruit was picked at that time and not recorded, so that the relative rank for this tree is really considerably higher than is

shown in the accompanying data. All instances in which fruit was lost, as described above, are noted in Table III.

Table IV shows the different forms of most frequent occurrence which were classed as variable fruits, and the total number of each form recorded from each of the trees listed in Table III during the investigational period. It will be noted that the large number of fruits of the Lisbon strain listed as collared, protruding blossom end, and ridged vary but slightly from the typical fruit of the variety and are continuous variations or fluctuations, probably caused to some extent by certain climatic conditions. These fluctuations are encountered in all the strains of this variety. A similar condition was found in the Eureka variety.

137435°—20—Bull. 815——2

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

[The weights of annual production are expressed in pounds and

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
1. Lisbon strain:												
Green grade—												
1913–14	588– 7	2,191	26– 7	95	3– 6	13	0– 4	1	4–12	18	.....	.....
1914–15	712–13	2,610	30–11	132	6– 0	26	2– 3	9	39– 4	140	28– 6	103
1915–16	579– 8	2,129	30–10	116	13– 1	55	2–12	10	1–15	7	2–10	10
1916–17	489– 9	1,821	32– 6	131	5– 0	20	0– 4	1	5– 0	17	5–13	23
Average	592.58	2,187.75	30.03	118.50	6.86	28.50	1.36	5.25	12.73	45.50	12.27	45.33
Tree-Ripe grade—												
1913–14	47–14	205	10– 4	46	0–15	4	0– 8	3	2– 1	11	.....	.....
1914–15	170– 6	716	18– 3	91	2– 5	15	3–10	18	0– 3	1	0–10	3
1915–16	109– 8	494	8– 1	36	14–10	72	7– 8	39	4–11	27	1– 3	7
1916–17	103– 0	469	8–10	45	3– 4	18	0– 7	2	5–12	29	1– 5	7
Average	107.69	471.00	11.28	54.50	5.28	27.25	3.02	15.50	3.17	17.00	1.04	5.67
Cull grade—												
1913–14	10–12	97	0–10	4	0– 5	2	0– 4	2	2– 6	39	.....	.....
1914–15	33–15	221	4– 8	34	3–14	36	1–10	15	0– 4	2	0–11	4
1915–16	52– 7	311	5– 8	35	7– 5	41	4– 6	31	0– 2	1	0– 9	4
1916–17	47–11	324	3–10	20	0–12	5	0– 0	0	0– 0	0	0–13	7
Average	36.20	238.25	3.56	23.25	3.06	21.00	1.56	12.00	0.69	10.50	0.69	5.00
Total crop—												
1913–14	647– 1	2,493	37– 5	145	4–10	19	1– 0	6	9– 3	68	.....	.....
1914–15	917– 2	3,547	53– 6	257	12– 3	77	7– 7	42	39–11	143	29–11	110
1915–16	741– 7	2,934	44– 3	187	35– 0	168	14–10	80	6–12	35	4– 6	21
1916–17	640– 4	2,614	44–10	196	9– 0	43	0–11	3	10–12	46	7–15	37
Average	736.47	2,897	44.88	196.25	15.20	76.75	5.94	32.75	16.59	73.00	14.00	56.00
Variable fruits—												
1913–14	.....	800	.....	12	.....	0	.....	0	.....	2	.....	.....
1914–15	.....	597	.....	49	.....	8	.....	2	.....	22	.....	19
1915–16	.....	1,589	.....	43	.....	13	.....	4	.....	1	.....	3
1916–17	.....	1,273	.....	102	.....	17	.....	0	.....	14	.....	15
Average	.....	1,064.75	.....	51.50	.....	9.50	.....	1.50	.....	9.75	.....	12.33
Average seeds per fruit—												
1913–14	.....	4.13	.....	6	.....	6	.....	4	.....	3	.....	.....
1914–15	.....	4.39	.....	2	.....	8	.....	3	.....	3	.....	2
1915–16	.....	4.53	.....	5	.....	4	.....	4	.....	12	.....	8
Average	.....	4.36	.....	4.44	.....	6.00	.....	3.67	.....	5.89	.....	4.67
5. Bull strain:												
Green grade—												
1914–15	738–10	2,641	3– 7	13	.....	(1)	12– 9	48	114–10	411	57– 3	196
1915–16	587– 6	2,044	19–12	71	5– 0	19	5– 8	18	7– 1	25	27– 9	95
1916–17	540–13	1,934	6– 7	23	1– 2	4	8–10	30	52–13	183	94– 0	327
Average	622.27	2,206.33	9.88	35.67	3.06	11.50	8.90	32.00	58.17	206.33	59.58	206.00
Tree-Ripe grade—												
1914–15	85–13	335	0–13	4	.....	(1)	1– 6	8	0– 0	0	0– 4	1
1915–16	26– 9	115	2–12	11	0–13	4	4–15	24	1– 2	5	1– 7	7
1916–17	44– 9	169	0– 0	0	0–12	4	0– 6	2	0– 0	0	1–11	6
Average	52.31	206.33	1.19	5.00	0.78	4.00	2.23	11.33	0.38	1.67	1.13	4.67
Cull grade—												
1914–15	14– 8	85	0– 8	4	.....	(1)	0–12	5	0– 4	1	0– 5	2
1915–16	16– 9	83	1– 2	6	1–11	9	1– 2	8	0– 2	1	0– 4	2
1916–17	29– 2	177	0– 2	1	0– 3	1	0– 0	0	0–12	4	0–13	5
Average	20.06	115.00	0.58	3.67	0.94	5.00	0.63	4.33	0.38	2.00	0.46	3.00
Total crop—												
1914–15	838–15	3,061	4–12	21	.....	(1)	14–11	61	114–14	412	57–12	199
1915–16	630– 8	2,242	23–10	88	7– 8	32	11– 9	50	8– 5	31	29– 4	104
1916–17	614– 8	2,280	6– 9	24	2– 1	9	9– 0	32	53– 9	187	96– 8	338
Average	694.65	2,527.67	11.65	44.33	4.78	20.50	11.75	47.67	58.92	210.00	61.17	213.67

[1] Fruit picked in August was carried away without being recorded.

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917, inclusive.

ounces, but the fractional averages are stated decimally in pounds.]

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
21–13	82	83– 8	332	155– 3	559	172– 1	625	.....	.....	91– 2	347	29–15	119
41–10	147	140–11	527	86– 2	312	108– 1	402	.....	.....	180–10	632	49– 3	180
22–13	82	109– 5	414	56– 8	232	125– 0	439	103– 1	362	64– 2	228	47–11	174
25–15	98	13– 3	50	120– 5	433	133–12	481	.....	.....	145– 0	556	2–15	11
22.44	81.80	86.67	330.75	104.53	384.00	134.72	486.75	103.06	362.00	68.70	251.86	32.44	121.00
1– 2	6	2– 2	9	8– 5	32	10– 1	39	.....	.....	11– 2	49	1– 6	6
8– 6	34	29– 2	114	24– 8	93	28– 6	107	.....	.....	31– 8	139	23– 9	101
2–11	12	6– 6	33	1–10	8	1–14	12	12–11	47	35–14	148	12– 5	53
1– 2	6	2– 5	10	24–14	94	18– 6	75	.....	.....	22–12	103	14– 3	80
2.66	11.60	9.98	41.50	14.83	56.75	14.67	58.25	12.69	47.00	14.46	62.71	12.86	60.00
0– 1	1	0–13	5	2– 0	12	1– 3	9	.....	.....	1–13	15	1– 5	8
0–14	5	0–14	5	8– 0	46	5– 8	26	.....	.....	5– 6	32	2– 6	16
1– 3	8	6– 0	37	9– 0	51	3–14	20	6– 8	39	5– 4	30	2–12	14
0– 7	4	1– 4	8	15–12	107	4– 7	32	.....	.....	13– 6	77	7– 4	64
0.51	3.60	2.23	13.75	8.69	54.00	3.75	21.75	6.50	39.00	3.69	22.00	3.42	25.50
23– 0	89	86– 7	346	165– 8	603	183– 5	673	.....	.....	104– 1	411	32–10	133
50–14	186	170–11	646	118–10	451	141–15	535	.....	.....	217– 8	803	75– 2	297
26–11	102	121–11	484	67– 2	291	130–12	471	122– 4	448	105– 4	406	62–12	241
27– 8	108	16–12	68	160–15	634	156– 9	588	.....	.....	181– 2	736	24– 6	155
25.61	**97.00**	**98.89**	**386.00**	**128.05**	**494.75**	**153.14**	**566.75**	**122.25**	**448.00**	**86.85**	**336.57**	**48.72**	**206.50**
.....	8	.....	101	.....	212	.....	304	.....	.....	.....	118	.....	43
.....	12	.....	104	.....	66	.....	103	.....	.....	.....	145	.....	67
.....	47	.....	331	.....	201	.....	386	.....	264	.....	162	.....	134
.....	79	.....	48	.....	413	.....	390	.....	.....	.....	195	.....	0
.....	29.20	.....	146.00	.....	223.00	.....	295.75	.....	264.00	.....	88.57	.....	61.00
.....	4	.....	5	.....	1	.....	5	.....	.....	.....	4	.....	4
.....	8	.....	2	.....	4	.....	3	.....	.....	.....	8	.....	6
.....	3	.....	1	.....	8	.....	3	.....	1	.....	4	.....	1
.....	4.98	.....	2.67	.....	4.44	.....	3.56	.....	0.67	.....	5.33	.....	3.78
91–11	321	147–11	550	72– 5	259	117– 7	417	63–13	227	.....	.....	57–14	199
88– 8	308	147–12	554	101– 3	312	74– 3	265	71– 3	245	24– 4	81	15– 7	51
109– 0	398	68–12	255	83– 8	304	67–12	240	.....	.....	.....	.....	48–13	170
96.40	342.33	121.40	453.00	85.67	291.67	86.46	307.33	67.50	236.00	24.25	81.00	20.35	70.00
5–11	22	23– 8	91	11–14	45	20– 9	77	19– 6	77	.....	.....	2– 6	10
2– 1	9	3– 0	15	5–14	21	0– 2	1	2– 0	8	1– 3	4	1– 4	6
2– 6	9	8– 0	33	8–12	33	14– 0	51	.....	.....	.....	.....	8–10	31
3.38	13.33	11.50	46.33	8.83	33.00	11.56	43.00	10.69	42.50	1.19	4.00	2.04	7.83
0– 0	0	1–12	9	3– 4	18	2– 7	13	4– 8	28	.....	.....	0–12	5
1– 2	6	1– 7	6	5– 2	21	0– 7	2	2–12	15	1– 3	6	0– 3	1
1– 2	7	0–12	8	13–12	94	4– 6	24	.....	.....	.....	.....	7– 4	33
0.75	4.33	1.31	7.67	7.38	44.33	2.42	13.00	3.63	21.50	1.19	6.00	1.36	6.50
97– 6	343	172–15	650	87– 7	322	140– 7	507	87–11	332	.....	.....	61– 0	214
91–11	323	152– 3	575	112– 3	354	74–12	268	75–15	268	26–10	91	16–14	58
112– 8	414	77– 8	296	106– 0	431	86– 2	315	.....	.....	.....	.....	64–11	234
100.52	**360.00**	**134.21**	**507.00**	**101.88**	**369.00**	**100.44**	**363.33**	**81.81**	**300.00**	**26.63**	**91.00**	**23.76**	**84.33**

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
5. Bull strain—Continued.												
Variable fruits—												
1914–15	------	647	------	2	-----	(1)	-----	15	------	34	-----	20
1915–16	------	1,352	------	30	-----	6	-----	2	------	10	-----	51
1916–17	------	1,284	------	10	-----	0	-----	13	------	103	-----	183
Average	------	1,094.33	------	14.00	-----	3.00	-----	10.00	------	49.00	-----	84.67
Average seeds per fruit—												
1914–15	------	5.44	------	4	-----	(1)	-----	1	------	6	-----	4
1915–16	------	4.75	------	13	-----	2	-----	2	------	8	-----	5
Average	------	5.05	------	8.67	-----	2.33	-----	1.67	------	7.25	-----	4.83
6. Lisbon strain:												
Green grade—												
1913–14	535–14	1,967	4–11	17	2– 0	8	1– 2	4	5– 4	21	-----	------
1914–15	740– 4	2,653	9– 7	39	5– 4	22	3–11	13	60– 9	229	65–12	234
1915–16	671–12	2,341	28– 1	104	5– 8	21	3– 1	12	11– 8	42	19– 8	70
1916–17	444– 8	1,630	25– 7	104	2– 7	9	3– 3	12	7– 6	26	17– 2	63
Average	598.09	2,147.75	16.91	66.00	3.80	15.00	2.77	10.25	21.17	79.50	34.13	122.33
Tree-Ripe grade—												
1913–14	39—3	167	1– 0	6	1– 2	5	1– 2	5	0– 6	2	-----	------
1914–15	88– 6	344	0–14	4	1– 5	7	0– 7	2	0–12	3	0– 4	1
1915–16	52– 0	234	10–10	45	3– 4	16	3– 0	15	5–14	32	1–12	10
1916–17	72–12	294	1– 5	6	1– 0	6	1– 2	5	2–10	12	1– 1	4
Average	63.08	259.75	3.45	15.25	1.67	8.50	1.42	6.75	2.41	12.25	1.02	5.00
Cull grade—												
1913–14	6– 0	46	0– 0	0	0– 0	0	0– 0	0	0– 7	5	-----	------
1914–15	12– 0	65	0– 4	1	1– 3	10	0– 0	0	0– 9	3	0– 3	1
1915–16	37– 4	226	3– 7	22	4– 0	27	9– 1	63	1– 1	9	0– 2	1
1916–17	63– 4	378	1– 2	5	1– 0	5	0–12	5	0– 3	1	0–13	8
Average	29.63	178.75	1.20	7.00	1.55	10.50	2.45	17.00	0.56	4.50	0.38	3.33
Total crop—												
1913–14	581– 1	2,180	5–11	23	3– 2	13	2– 4	9	6– 1	28	-----	------
1914–15	840–10	3,062	10– 9	44	7–12	39	4– 2	15	61–14	235	66– 3	236
1915–16	761– 0	2,801	42– 2	171	12–12	64	15– 2	90	18– 7	83	21– 6	81
1916–17	580– 8	2,302	27–14	115	4– 7	20	5– 1	22	10– 3	39	19– 0	75
Average	**690.80**	**2,586.25**	**21.56**	**88.25**	**7.02**	**34.00**	**6.64**	**34.00**	**24.14**	**96.25**	**35.52**	**130.67**
Variable fruits—												
1913–14	------	607	------	5	-----	1	-----	1	------	5	-----	------
1914–15	------	546	------	16	-----	9	-----	4	------	33	-----	27
1915–16	------	1,711	------	38	-----	4	-----	4	------	9	-----	37
1916–17	------	1,196	------	42	-----	5	-----	2	------	19	-----	42
Average	------	1,015.00	------	25.25	-----	4.75	-----	2.75	------	16.50	-----	35.33
Average seeds per fruit—												
1913–14	------	4.70	------	2	-----	4	-----	3	------	3	-----	------
1914–15	------	3.13	------	5	-----	3	-----	2	------	0	-----	0
1915–16	------	4.39	------	5	-----	6	-----	3	------	6	-----	7
Average	------	4.06	------	4.25	-----	4.88	-----	2.85	------	3.11	-----	3.33
10. Bull strain:												
Green grade—												
1914–15	706– 2	2,507	0–11	3	-----	(1)	22–10	89	162– 6	572	61–14	217
1915–16	572–10	2,105	11–14	44	0– 4	1	2–14	10	9– 0	32	24– 9	88
1916–17	520–12	1,883	5–15	22	0– 4	1	3– 4	10	36– 2	125	72–13	260
Average	599.83	2,165.00	6.17	23.00	0.25	1.00	9.58	36.33	69.17	243.00	53.08	188.33
Tree-Ripe grade—												
1914–15	65–12	250	0– 3	1	-----	(1)	0–12	3	0– 6	2	0– 8	2
1915–16	26– 3	116	0–14	4	0– 3	1	1–12	9	1– 7	6	1–13	8
1916–17	61– 2	239	0– 6	2	0– 3	1	0– 0	0	0–15	4	0–14	4
Average	51.02	201.67	0.48	2.33	0.19	1.00	0.83	4.00	0.92	4.00	1.06	4.67

[1] Fruit picked in August was carried away without being recorded.

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
.....	95	.....	216	.....	70	.....	120	.....	40	.....	.....	.....	35
.....	182	.....	428	.....	229	.....	202	.....	141	.....	45	.....	23
.....	275	.....	184	.....	219	.....	196	.....	.....	.....	.....	.....	101
.....	184.00	.....	276.00	.....	172.67	.....	172.67	.....	90.50	.....	45.00	.....	27.00
.....	5	.....	4	.....	3	.....	8	.....	8	.....	.....	.....	11
.....	5	.....	2	.....	4	.....	4	.....	2	.....	6	.....	4
.....	5.40	.....	3.17	.....	3.33	.....	5.67	.....	5.00	.....	6.00	.....	7.50
64– 9	234	134– 3	521	106– 9	383	154– 8	542	.....	.....	44–15	168	18– 1	69
69– 8	248	144– 7	538	118– 5	413	85– 1	308	.....	.....	150– 7	507	27–13	102
77– 0	167	197–14	721	66– 2	256	110– 1	401	70–10	249	64–11	233	17–12	65
77–10	281	49–13	190	104– 3	380	85–14	307	.....	.....	64–12	233	6–11	25
57.74	186.00	131.58	492.50	98.80	358.00	108.88	389.50	70.63	249.00	46.40	163.00	17.58	65.25
4– 0	21	0– 6	2	11– 2	42	8– 5	33	.....	.....	10– 6	45	1– 6	6
5– 4	20	21– 0	81	21–14	83	16–10	63	.....	.....	13–14	54	6– 2	26
2– 4	9	4– 1	20	1– 9	8	0– 8	3	8–10	33	6–11	27	3–13	16
3– 6	14	5– 2	20	18–11	71	13– 7	50	.....	.....	20–11	81	4– 5	25
2.98	12.80	7.64	30.75	13.31	51.00	9.72	37.25	8.63	33.00	7.38	29.57	3.91	18.25
0–13	10	0–11	5	1– 0	6	1–12	9	.....	.....	1– 2	10	0– 3	1
0– 0	0	0– 9	3	3–12	17	0–15	5	.....	.....	3– 1	16	1– 8	9
1–12	9	4– 4	21	6– 1	34	2– 3	10	1–14	10	2– 1	11	1– 6	9
0– 4	2	2–11	18	16–14	107	3– 4	20	.....	.....	33– 5	181	3– 0	26
0.56	4.20	2.05	11.75	6.92	41.00	2.03	11.00	1.88	10.00	5.65	31.14	1.52	11.25
69– 6	265	135– 4	528	118–11	431	164– 9	584	.....	.....	56– 7	223	19–10	76
74–12	268	166– 0	622	143–15	513	102–10	376	.....	.....	167– 6	577	35– 7	137
81– 0	185	206– 3	762	73–12	298	112–12	414	81– 2	292	73– 7	271	22–15	90
81– 4	297	57–10	228	139–12	558	102– 9	377	.....	.....	118–12	495	14– 0	76
61.28	**203.00**	**141.27**	**535.00**	**119.03**	**450.00**	**120.63**	**437.75**	**81.13**	**292.00**	**59.43**	**223.71**	23.00	94.75
.....	31	.....	128	.....	133	.....	217	.....	.....	.....	55	.....	31
.....	24	.....	105	.....	90	.....	78	.....	.....	.....	125	.....	35
.....	203	.....	539	.....	204	.....	333	.....	179	.....	120	.....	41
.....	235	.....	169	.....	344	.....	236	.....	.....	.....	102	.....	0
.....	98.60	.....	235.25	.....	192.75	.....	216.00	.....	179.00	.....	57.43	.....	26.75
.....	5	.....	8	.....	5	.....	5	.....	.....	.....	1	.....	6
.....	0	.....	2	.....	2	.....	8	.....	.....	.....	7	.....	5
.....	1	.....	3	.....	7	.....	4	.....	3	.....	2	.....	6
.....	2.38	.....	4.33	.....	4.89	.....	5.67	.....	2.67	.....	3.33	.....	5.56
106–15	381	69– 0	258	99– 8	352	93–10	325	46–13	163	.....	.....	42–11	**147**
76– 4	267	159– 7	608	101– 3	402	66– 7	238	90– 0	307	21– 3	75	9– 9	33
88–14	340	46– 8	175	91– 9	335	89–10	320	.....	.....	.....	.....	85–13	295
90.69	329.33	91.65	347.00	97.42	363.00	83.23	294.33	68.41	235.00	21.18	75.00	23.01	79.17
9– 8	36	14– 2	56	8–12	32	14– 4	52	13–11	51	.....	.....	3–10	15
2– 1	9	0–14	4	5–14	31	0– 0	0	6– 5	22	3– 8	14	1– 8	8
5–10	23	6– 4	26	12–13	49	12– 1	45	.....	.....	.....	.....	22– 0	85
5.73	22.67	7.08	28.67	9.15	37.33	8.77	32.33	10.00	36.50	3.50	14.00	4.52	18.00

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
10. Bull strain—Continued.												
Cull grade—												
1914–15	10– 5	54	0– 5	2	.....	(1)	1– 5	6	0– 3	1	0– 0	0
1915–16	13– 7	69	1– 4	7	1– 1	6	0–10	4	0– 7	2	0– 0	0
1916–17	21– 7	131	1– 9	7	0– 0	0	0–15	7	0– 8	2	0– 5	2
Average	15.06	84.67	1.04	5.33	0.53	3.00	0.96	5.67	0.38	1.67	0.10	0.67
Total crop—												
1914–15	782– 3	2,811	1– 3	6	.....	(1)	24–11	98	162–15	575	62– 6	219
1915–16	612– 4	2,290	14– 0	55	1– 8	8	5– 4	23	10–14	40	26– 6	96
1916–17	603– 5	2,253	7–14	31	0– 7	2	4– 3	17	37– 9	131	74– 0	266
Average	**665.92**	**2,451.33**	**7.69**	**30.67**	**0.97**	**5.00**	**11.38**	**46.00**	**70.46**	**248.67**	**54.25**	**193.67**
Variable fruits—												
1914–15	.....	551	.....	1	.....	(1)	.....	23	.....	62	.....	20
1915–16	.....	1,329	.....	18	.....	0	.....	0	.....	8	.....	46
1916–17	.....	1,262	.....	11	.....	1	.....	2	.....	74	.....	167
Average	.....	1,047.33	.....	10.00	.....	0.50	.....	8.33	.....	48.00	.....	77.67
Average seeds per fruit—												
1914–15	.....	5.00	.....	4	.....	(1)	.....	1	.....	3	.....	4
1915–16	.....	3.29	.....	0	.....	4	.....	2	.....	4	.....	3
Average	.....	4.08	.....	2.17	.....	4.00	.....	1.50	.....	3.33	.....	3.25
13. Lisbon strain:												
Green grade—												
1913–14	576–15	2,206	26– 1	99	8–10	35	1– 6	6	6– 6	27	.....	.....
1914–15	600– 2	2,180	17– 0	68	4– 0	18	1–10	7	9–14	39	14–12	55
1915–16	504– 1	1,867	52– 8	197	5– 3	22	2– 9	10	2– 5	9	2– 2	8
1916–17	397– 7	1,470	27– 2	107	0– 0	0	0–10	2	1– 1	4	2–10	10
Average	519.64	1,930.75	30.67	117.75	4.45	18.75	1.55	6.25	4.91	19.75	6.50	24.33
Tree-Ripe grade—												
1913–14	71–10	319	7–13	37	5–14	31	1–14	12	2–10	16	.....	.....
1914–15	168–10	699	8– 6	42	0–15	6	1– 6	7	0– 7	3	0– 3	1
1915–16	93–15	432	23– 9	106	4– 9	23	9–12	49	5–14	32	1– 6	7
1916–17	79–13	347	6– 7	35	0– 8	3	0– 0	0	1– 1	5	0– 9	3
Average	103.50	449.25	11.55	55.00	2.97	15.75	3.25	17.00	2.50	14.00	0.71	3.67
Cull grade—												
1913–14	9– 0	67	1–12	15	0–14	6	0– 0	0	1– 4	10	.....	.....
1914–15	24– 2	149	1– 6	12	2– 8	19	1–11	12	0– 3	1	0– 2	1
1915–16	52–11	312	7–10	43	9– 2	56	13–12	98	1– 2	9	0– 7	4
1916–17	49–14	352	1–13	9	0– 6	3	1– 5	8	0– 0	0	1– 0	10
Average	33.92	220.00	3.14	19.75	3.22	21.00	4.19	29.50	0.64	5.00	0.52	5.00
Total crop—												
1913–14	657– 9	2,592	35–10	151	15– 6	72	3– 4	18	10– 4	53	.....	.....
1914–15	792–14	3,028	26–12	122	7– 7	43	4–11	26	10– 8	43	15– 1	57
1915–16	650–11	2,611	83–11	346	18–14	101	26– 1	157	9– 5	50	3–15	19
1916–17	527– 2	2,169	35– 6	151	0–14	6	1–15	10	2– 2	9	4– 3	23
Average	**657.06**	**2,600.00**	**45.36**	**192.5**	**10.64**	**55.50**	**8.98**	**52.75**	**8.05**	**38.75**	**7.73**	**33.00**
Variable fruits—												
1913–14	.....	864	.....	10	.....	2	.....	0	.....	3	.....	.....
1914–15	.....	593	.....	25	.....	6	.....	4	.....	12	.....	6
1915–16	.....	1,477	.....	73	.....	4	.....	3	.....	3	.....	3
1916–17	.....	835	.....	82	.....	2	.....	0	.....	2	.....	8
Average	.....	942.25	.....	47.50	.....	3.50	.....	1.75	.....	5.00	.....	5.67
Averageseeds per fruit—												
1913–14	.....	5.04	.....	5	.....	10	.....	6	.....	1	.....	.....
1914–15	.....	5.16	.....	5	.....	2	.....	1	.....	2	.....	2
1915–16	.....	5.69	.....	8	.....	11	.....	4	.....	8	.....	5
Average	.....	5.32	.....	6.00	.....	7.56	.....	3.38	.....	3.67	.....	3.67

[1] Fruit picked in August was carried away without being recorded.

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
0–11	4	1– 1	4	2–10	15	1– 2	5	2– 6	13	.....	.....	0–10	4
0–10	4	1–10	7	5– 2	24	0– 9	4	1– 0	5	0– 7	2	0–11	4
0– 0	0	0– 7	4	14–10	94	0– 0	0	.....	.....	.....	.....	3– 1	15
0.44	2.67	1.04	5.00	7.46	44.33	0.56	3.00	1.69	9.00	0.44	2.00	0.73	3.83
117– 2	421	84– 3	318	110–14	399	109– 0	382	62–14	227	.....	.....	46–15	166
78–15	280	161–15	619	112– 3	457	67– 0	242	97– 5	334	25– 2	91	11–12	45
94– 8	363	53– 3	205	119– 0	478	101–11	365	.....	.....	.....	.....	110–14	395
96.85	**354.67**	**99.77**	**380.67**	**114.02**	**444.67**	**92.56**	**329.67**	**80.09**	**280.50**	**25.13**	**91.00**	**28.26**	**101.00**
.....	102	.....	95	.....	98	.....	88	.....	36	.....	.....	.....	26
.....	151	.....	439	.....	274	.....	196	.....	145	.....	34	.....	18
.....	243	.....	120	.....	256	.....	253	.....	.....	.....	.....	.....	135
.....	165.33	.....	218.00	.....	209.33	.....	179.00	.....	90.50	.....	34.00	.....	29.83
.....	0	.....	9	.....	3	.....	9	.....	8	.....	.....	.....	8
.....	4	.....	0	.....	4	.....	5	.....	6	.....	5	.....	4
.....	2.17	.....	4.50	.....	3.33	.....	7.60	.....	7.17	.....	4.67	.....	5.83
27– 0	103	96–14	382	183– 8	695	125–12	466	.....	.....	81–13	314	19– 9	79
34– 1	123	75–14	288	89–11	316	83–14	311	.....	.....	206–11	722	62–11	233
22– 0	82	97–14	368	81– 2	314	82– 6	299	99– 7	357	34– 6	124	22– 3	77
15–15	57	16–15	65	76– 9	275	120– 9	430	.....	.....	133–10	510	2– 6	10
19.80	73.00	71.89	275.75	107.72	400.00	103.14	376.50	99.44	357.00	65.21	238.57	26.70	99.75
2– 8	14	1– 6	6	21–15	84	9– 3	37	.....	.....	15–10	69	2–13	13
4– 2	16	16– 6	66	31– 8	117	36– 3	139	.....	.....	44– 1	186	25– 1	116
3– 4	15	3–10	20	4–12	31	0– 0	0	11– 0	42	12– 3	52	14– 0	55
0– 4	2	3– 4	13	12– 1	45	22– 9	88	.....	.....	26– 2	113	7– 0	40
2.03	9.40	6.16	26.25	17.56	69.25	16.98	66.00	11.00	42.00	14.00	60.00	12.22	56.00
0– 1	1	0– 0	0	2– 5	15	1– 5	8	.....	.....	1– 5	11	0– 2	1
0– 0	0	1– 5	8	3– 2	18	3–13	22	.....	.....	4– 4	23	5–12	33
0– 3	1	3– 6	16	9–10	43	1–10	9	2– 0	12	2– 7	12	1– 6	9
0–11	5	3– 2	22	14– 5	104	8– 9	62	.....	.....	12– 1	71	6–10	58
0.19	1.40	1.95	11.50	7.34	45.00	3.83	25.25	2.00	12.00	2.87	16.71	3.47	25.25
29– 9	118	98– 4	388	207–12	794	136– 4	511	.....	.....	98–12	394	22– 8	93
38– 3	139	93– 9	362	124– 5	451	123–14	472	.....	.....	255– 0	931	93– 8	382
25– 7	98	104–14	404	95– 8	388	84– 0	308	112– 7	411	49– 0	188	37– 9	141
16–14	64	23– 5	100	102–15	424	151–11	580	.....	.....	171–13	694	16– 0	108
22.01	**83.80**	**80.00**	**313.50**	**132.63**	**514.25**	**123.95**	**467.75**	**112.44**	**411.00**	**82.08**	**315.29**	**42.39**	**181.00**
.....	14	.....	96	.....	317	.....	264	.....	.....	.....	128	.....	30
.....	20	.....	57	.....	107	.....	112	.....	.....	.....	181	.....	63
.....	58	.....	329	.....	283	.....	267	.....	285	.....	91	.....	78
.....	47	.....	58	.....	258	.....	185	.....	.....	.....	193	.....	0
.....	27.80	.....	135.00	.....	241.25	.....	207.00	.....	285.00	.....	84.71	.....	42.75
.....	5	.....	3	.....	3	.....	5	.....	.....	.....	6	.....	6
.....	4	.....	5	.....	7	.....	7	.....	.....	.....	15	.....	7
.....	4	.....	5	.....	1	.....	9	.....	3	.....	8	.....	3
.....	4.13	.....	4.88	.....	3.78	.....	6.75	.....	2.67	.....	9.44	.....	5.33

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
17. Lisbon strain:												
Green grade—												
1913–14	463– 4	1,738	22– 6	82	4–10	17	0– 4	1	2– 6	10	.....	.....
1914–15	719–14	2,588	9–12	38	4– 4	16	19–11	74	90–12	330	81– 3	288
1915–16	502– 8	1,825	32– 7	114	6– 7	26	6– 0	21	12–12	46	23–10	85
1916–17	571–11	2,064	19– 4	73	1– 3	5	1– 2	4	10– 8	36	19–14	71
Average	564. 33	2,053. 75	20. 95	76. 75	4. 13	16. 00	6. 77	25. 00	29. 09	105. 50	41. 56	148. 00
Tree-Ripe grade—												
1913–14	15–14	75	4– 2	21	0–11	4	0– 6	2	1– 1	6	.....	.....
1914–15	60–14	242	3–.0	13	0– 3	1	2– 3	12	0– 0	0	0– 8	2
1915–16	49–11	233	14– 0	62	3–14	20	6–11	33	4– 5	23	0–10	3
1916–17	73– 2	318	2– 6	12	0– 3	1	0– 6	2	4– 9	20	0–12	3
Average	49. 89	217. 00	5. 88	27. 00	1. 23	6. 50	2. 41	12. 25	2. 48	12. 25	0. 63	2. 67
Cull grade—												
1913–14	7– 8	55	0–11	7	0– 4	2	0– 0	0	1– 6	10	.....	.....
1914–15	10– 4	57	0– 8	2	0–14	6	0– 7	3	0– 0	0	0– 3	1
1915–16	22– 6	129	2– 0	13	3– 6	21	4– 9	30	0– 8	3	0–12	5
1916–17	80–10	528	0– 5	2	0– 4	1	1– 2	8	0– 0	0	0– 8	4
Average	30. 19	192. 25	0. 88	6. 00	1. 19	7. 50	1. 53	10. 25	0. 47	3. 25	0. 48	3. 33
Total crop—												
1913–14	486–10	1,868	27– 3	110	5– 9	23	0–10	3	4–13	26	.....	.....
1914–15	791– 0	2,887	13– 4	53	5– 5	23	22– 5	89	90–12	330	81–14	291
1915–16	574– 9	2,187	48– 7	189	13–11	67	17– 4	84	17– 9	72	25– 0	93
1916–17	725– 7	2,910	21–15	87	1–10	7	2–10	14	15– 1	56	21– 2	78
Average	**644. 41**	**2,463. 00**	**27. 70**	**109. 75**	**6. 55**	**30. 00**	**10. 70**	**47. 50**	**32. 05**	**121. 00**	**42. 67**	**154. 00**
Variable fruits—												
1913–14	.....	757	.....	7	.....	2	.....	0	.....	0	.....	.....
1914–15	.....	569	.....	19	.....	2	.....	31	.....	41	.....	49
1915–16	.....	1,283	.....	40	.....	4	.....	7	.....	14	.....	36
1916–17	.....	1,260	.....	44	.....	1	.....	3	.....	16	.....	40
Average	.....	967. 25	.....	27. 50	.....	2. 25	.....	10. 25	.....	17. 75	.....	41. 67
Average seeds per fruit—												
1913–14	.....	2. 36	.....	2	.....	4	.....	5	.....	2	.....	.....
1914–15	.....	2. 29	.....	3	.....	1	.....	3	.....	3	.....	2
1915–16	.....	2. 11	.....	6	.....	2	.....	1	.....	4	.....	2
Average	.....	2. 14	.....	3. 56	.....	2. 33	.....	2. 63	.....	3. 14	.....	1. 67
22. Sporting strain:												
Green grade—												
1913–14	496–14	1,894	(1)	.....	(2)	.....	1– 5	5	2– 5	9	.....	.....
1914–15	672– 0	2,434	17– 3	70	2–10	11	2– 5	9	51– 2	189	42– 5	151
1915–16	534– 5	1,970	16– 9	73	11–14	50	2– 5	9	5– 0	19	6–12	24
1916–17	374–10	1,401	13–11	57	2– 6	10	2– 1	7	6– 8	24	4–10	55
Average	519. 45	1,924. 75	15. 81	66. 67	5. 63	23. 67	2. 00	7. 50	16. 23	60. 25	17. 90	76. 67
Tree-Ripe grade—												
1913–14	12– 7	54	(1)	.....	(2)	.....	0– 3	1	1– 0	5	.....	.....
1914–15	123– 2	426	7– 0	36	1– 1	6	2– 2	11	1– 3	5	0– 3	1
1915–16	56– 9	263	15– 7	68	6–15	36	4– 7	24	3– 6	18	0– 3	1
1916–17	87– 6	313	0– 7	2	1– 6	8	0–10	3	2– 7	10	0–11	4
Average	69. 88	264. 00	7. 63	35. 33	3. 13	16. 67	1. 84	9. 75	2. 00	9. 50	0. 35	2. 00
Cull grade—												
1913–14	6– 5	50	(1)	.....	(2)	.....	1– 1	10	0– 0	0	.....	.....
1914–15	17– 9	107	1– 8	12	0–11	5	0–12	5	0– 6	2	0– 8	3
1915–16	43– 2	263	8–11	54	12– 7	78	5– 7	41	0–11	6	0– 0	0
1916–17	53–10	323	1– 0	6	0–13	5	0–10	4	0– 0	0	0– 4	2
Average	30. 16	185. 75	3. 73	24. 00	4. 65	29. 33	1. 97	15. 00	0. 27	2. 00	0. 25	1. 67

[1] This tree was not included in the performance-record plat until September, 1913.
[2] Fruit picked in August was carried away without being recorded.

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
43– 0	158	125– 9	488	160– 4	586	62– 4	237	.....	.....	29– 9	110	13– 0	49
68–10	245	135–15	501	89– 3	314	66–15	243	.....	.....	105– 4	364	48– 5	175
63– 0	218	121– 2	451	84– 4	323	53– 9	193	52– 8	182	28–14	103	17–15	63
46–14	174	39– 2	145	121– 0	446	153–13	515	.....	.....	157– 9	590	1– 6	5
44.30	159.00	105.44	396.25	113.67	417.25	84.14	297.00	52.50	182.00	45.89	166.71	20.16	73.00
0–10	4	0– 0	0	1– 6	5	3– 0	14	.....	.....	3– 8	14	1– 2	5
7– 0	26	16–10	65	11– 0	41	9– 3	35	.....	.....	7– 7	31	3–12	16
6–12	29	4– 8	24	1– 1	6	0– 0	0	2–14	12	2– 1	9	2–15	12
0–14	4	1–14	9	4– 9	18	11– 5	43	.....	.....	40– 6	177	5–14	29
3.05	12.60	5.75	24.50	4.50	17.50	5.88	23.00	2.88	12.00	7.63	33.00	3.42	15.50
0– 4	3	0–10	4	1–14	15	1– 4	7	.....	.....	0–13	5	0– 6	2
0–14	5	1– 4	6	2– 6	10	0– 6	3	.....	.....	2– 0	13	1– 6	8
0–14	5	1– 8	7	3–12	20	1– 0	4	2– 5	12	1– 6	7	0– 6	2
0– 4	2	0– 4	2	15– 2	104	6–15	44	.....	.....	33–10	203	22– 4	158
0.45	3.00	0.91	4.75	5.78	37.25	2.39	14.50	2.31	12.00	5.40	32.57	6.09	42.05
43–14	165	126– 3	492	163– 8	606	66– 8	258	.....	.....	33–14	129	14– 8	56
76– 8	276	153–13	572	102– 9	365	76– 8	281	.....	.....	114–11	408	53– 7	199
70–10	252	127– 2	482	89– 1	349	54– 9	197	57–11	206	32– 5	119	21– 4	77
48– 0	180	41– 4	156	140–11	568	172– 1	602	.....	.....	231– 9	970	29– 8	192
47.80	**174.60**	**112.09**	**425.50**	**123.95**	**472.00**	**92.41**	**334.50**	**57.69**	**206.00**	**58.92**	**232.29**	**29.67**	**131.00**
.....	40	.....	257	.....	287	.....	83	.....	.....	.....	63	.....	18
.....	52	.....	69	.....	63	.....	90	.....	.....	.....	104	.....	49
.....	148	.....	356	.....	256	.....	163	.....	160	.....	50	.....	49
.....	128	.....	103	.....	252	.....	414	.....	.....	.....	254	.....	5
.....	73.60	.....	196.25	.....	214.50	.....	187.50	.....	160.00	.....	67.29	.....	30.25
.....	3	.....	4	.....	1	.....	2	.....	.....	.....	2	.....	1
.....	2	.....	0	.....	1	.....	1	.....	.....	.....	4	.....	6
.....	0	.....	4	.....	0	.....	5	.....	1	.....	0	.....	1
.....	1.67	.....	2.50	.....	0.89	.....	2.38	.....	0.33	.....	2.00	.....	2.67
72– 1	303	138–10	518	166– 9	610	57– 4	222	.....	.....	42– 0	163	16–12	64
73–10	260	118–10	439	83– 8	300	100– 4	364	.....	.....	135– 1	472	45– 6	169
61– 0	210	137–11	517	78–12	308	67– 3	241	86– 1	302	34–12	122	26– 6	95
53– 1	196	19–14	75	87– 4	315	104– 4	366	.....	.....	73–13	270	7– 2	26
51.95	193.80	103.70	387.25	104.02	383.25	82.23	298.25	86.06	302.00	40.80	146.71	23.91	88.50
0–10	2	0– 4	1	1–14	8	2–14	13	.....	.....	4–10	20	1– 0	4
6– 2	22	15–13	64	10–12	41	25– 8	98	.....	.....	19– 1	78	34– 5	64
3–11	16	1– 2	6	5– 6	28	0– 0	0	0–12	3	11–12	47	3– 8	16
1– 2	5	1– 2	5	9– 6	34	30– 3	67	.....	.....	31– 0	125	9– 0	50
2.31	9.00	4.58	19.00	6.84	27.75	14.64	44.50	0.75	3.00	9.49	38.57	11.95	33.50
0–10	4	0–10	5	2– 8	19	0– 7	4	.....	.....	0–10	5	0– 7	3
0– 2	1	1– 6	8	1– 6	7	2– 6	14	.....	.....	4–10	29	3–14	21
1– 2	8	2– 8	11	6–12	39	1– 6	6	1–14	9	1–14	9	0– 6	2
0– 7	3	1– 2	7	13– 8	85	1–14	13	.....	.....	30– 0	166	4– 0	32
0.46	3.20	1.41	7.75	6.03	37.50	1.52	9.25	1.88	9.00	5.30	29.86	2.17	14.50

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
22. Sporting strain—Contd.												
Total crop—												
1913–14	515–10	1,998	(1)	.....	(1)	.....	2– 9	16	3– 5	14	.....	.....
1914–15	812–11	2,967	25–11	118	4– 6	22	5– 3	25	52–11	196	43– 0	155
1915–16	634– 0	2,496	40–11	195	31– 4	164	12– 3	74	9– 1	43	6–15	25
1916–17	515–10	2,037	15– 2	65	4– 9	23	3– 5	14	8–15	34	5– 9	61
Average	**619. 48**	**2,374. 50**	**27. 16**	**126. 00**	**13. 40**	**69. 67**	**5. 81**	**32. 25**	**18. 50**	**71. 75**	**18. 50**	**80. 33**
Variable fruits—												
1913–14	.....	1,064	.....	(1)	.....	(1)	.....	3	.....	6	.....	.....
1914–15	.....	1,061	.....	46	.....	6	.....	9	.....	74	.....	32
1915–16	.....	1,455	.....	61	.....	26	.....	11	.....	12	.....	17
1916–17	.....	1,225	.....	37	.....	5	.....	4	.....	25	.....	41
Average	.....	1,201. 25	.....	46. 00	.....	12. 33	.....	6. 75	.....	29. 25	.....	30. 00
Average seeds per fruit..												
1913–14	.....	3. 13	.....	(1)	.....	(1)	.....	5	.....	0	.....	.....
1914–15	.....	2. 93	.....	3	.....	1	.....	1	.....	1	.....	3
1915–16	.....	3. 94	.....	3	.....	3	.....	1	.....	6	.....	5
Average	.....	3. 38	.....	3. 17	.....	2. 17	.....	2. 22	.....	2. 75	.....	3. 80
24. Bull strain:												
Green grade—												
1914–15	590– 3	2,146	1–10	6	.....	(2)	11– 4	42	95–14	353	.....	(2)
1915–16	540– 8	1,896	16– 2	58	6– 2	26	3–11	14	4– 9	17	16– 1	56
1916–17	505– 0	1,803	6– 0	22	1– 6	6	4–13	17	35– 8	122	76– 0	267
Average	545. 23	1,948. 33	7. 92	28. 67	3. 75	16. 0	6. 58	24. 33	45. 31	164. 00	46. 03	161. 50
Tree-Ripe grade—												
1914–15	99– 0	381	0–10	3	.....	(2)	0– 3	1	0– 0	0	.....	(2)
1915–16	17– 9	78	0–12	3	1–15	9	2– 0	10	0–15	5	1– 8	7
1916–17	37– 1	145	0–14	4	0– 5	2	0– 8	2	0– 3	1	1– 1	4
Average	51. 21	201. 33	0. 75	3. 33	1. 13	5. 50	0. 90	4. 33	0. 38	2. 00	1. 28	5. 50
Cull grade—												
1914–15	11– 0	58	0– 4	2	.....	(2)	0–13	5	0– 3	1	.....	(2)
1915–16	12– 8	71	1– 4	8	1–14	11	0–10	6	0– 6	2	0– 7	3
1916–17	30–12	216	0–11	3	0– 2	1	1– 6	10	1– 6	10	0– 3	2
Average	18. 08	115. 00	0. 73	4. 33	1. 00	6. 00	0. 94	7. 00	0. 65	4. 33	0. 31	2. 50
Total crop—												
1914–15	700– 3	2,585	2– 8	11	.....	(2)	12– 4	48	96– 1	354	.....	(2)
1915–16	570– 9	2,045	18– 2	69	9–15	46	6– 5	30	5–14	24	18– 0	66
1916–17	572–13	2,164	7– 9	29	1–13	9	6–11	29	37– 1	133	77– 4	273
Average	**614. 52**	**2,264. 67**	**9. 40**	**36. 33**	**5. 88**	**27. 50**	**8. 42**	**35. 67**	**46. 33**	**170. 33**	**47. 63**	**169. 50**
Variable fruits—												
1914–15	.....	582	.....	4	.....	(2)	.....	10	.....	28	.....	(2)
1915–16	.....	1,373	.....	15	.....	3	.....	3	.....	8	.....	35
1916–17	.....	1,096	.....	12	.....	1	.....	9	.....	56	.....	140
Average	.....	1,017. 00	.....	10. 33	.....	2. 00	.....	7. 33	.....	30. 67	.....	87. 50
Average seeds per fruit—												
1914–15	.....	6. 12	.....	2	.....	(2)	.....	3	.....	0	.....	(2)
1915–16	.....	4. 50	.....	2	.....	4	.....	6	.....	12	.....	2
Average	.....	5. 20	.....	2. 00	.....	4. 00	.....	4. 50	.....	7. 20	.....	2. 00
26. Lisbon strain:												
Green grade—												
1913–14	418–11	1,544	15– 6	52	5– 3	20	1–10	5	12– 5	51	45– 5	.....
1914–15	725– 9	2,587	8– 2	33	7– 4	28	8–10	35	40–11	149	1– 2	163
1915–16	510–14	1,844	35– 1	129	16– 7	65	1– 5	5	5– 9	20	5–14	61
1916–17	458– 2	1,717	13–13	55	3–10	15	2–15	11	6–10	23	5–14	23
Average	528. 31	1,923. 00	18. 09	67. 25	8. 13	32. 00	3. 63	14. 00	16. 30	60. 75	22. 77	82. 33

[1] This tree was not included in the performance-record plat until September, 1913.
[2] Fruit picked in August and November were carried away without being recorded.

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
73– 5	309	139– 8	524	170–15	637	60– 9	239	.....	.....	47– 4	188	18– 3	71
79–14	283	135–13	511	95–10	348	128– 2	476	.....	.....	158–12	579	83– 9	254
65–13	234	141– 5	534	90–14	375	68– 9	247	88–11	314	48– 6	178	30– 4	113
54–10	204	22– 2	87	110– 2	434	136– 5	446	.....	.....	134–13	561	20– 2	108
54. 73	**206. 00**	**109. 69**	**414. 00**	**116. 89**	**448. 50**	**98. 39**	**352. 00**	**88. 69**	**314. 00**	**55. 60**	**215. 14**	**38. 03**	**136. 50**
.....	141	.....	280	.....	337	.....	143	.....	.....	.....	111	.....	43
.....	52	.....	181	.....	164	.....	193	.....	.....	.....	194	.....	110
.....	171	.....	416	.....	282	.....	221	.....	80	.....	94	.....	64
.....	173	.....	66	.....	269	.....	374	.....	.....	.....	211	.....	20
.....	107. 40	.....	235. 75	.....	263. 00	.....	232. 75	.....	80. 00	.....	87. 14	.....	59. 25
.....	5	.....	3	.....	5	.....	4	.....	.....	.....	2	.....	1
.....	3	.....	4	.....	0	.....	5	.....	.....	.....	.....	.....	7
.....	2	.....	6	.....	6	.....	0	.....	5	.....	6	.....	3
.....	3. 22	.....	4. 44	.....	3. 67	.....	3. 38	.....	5. 33	.....	4. 17	.....	3. 44
90– 7	319	134–14	502	40–13	152	83–13	311	76– 8	270	.....	.....	55– 0	191
70–14	251	105–10	407	56– 4	220	109– 3	325	105– 3	358	24– 1	87	22–12	77
115– 4	426	36– 4	135	91– 8	320	75–5	268	.....	.....	.....	.....	63– 0	220
92. 19	332. 00	92. 25	348. 00	62. 85	230. 67	89. 44	301. 33	90. 84	314. 00	24. 06	87. 00	23. 46	81. 33
11– 9	42	37–14	145	12– 3	46	14– 5	55	19– 8	78	.....	.....	2–12	11
1– 5	5	0–13	3	1–13	10	0– 0	0	1–12	6	2– 6	10	2– 6	10
1– 5	5	3– 6	14	4– 0	14	6– 9	24	.....	.....	.....	.....	18–14	75
4. 73	17. 33	14. 02	54. 00	6. 00	23. 33	6. 96	26. 33	10. 63	42. 00	2. 38	10. 00	4. 00	16. 00
0–10	3	2– 4	10	1–12	9	2– 0	9	2–11	16	.....	.....	0– 7	3
0– 0	0	0–10	3	1– 8	8	0–14	5	3– 4	16	0–14	5	0–13	4
0– 0	0	1– 0	7	19–12	146	1–14	14	.....	.....	.....	.....	4– 6	23
0. 21	1. 00	1. 29	6. 67	7. 67	54. 33	1. 58	9. 33	2. 97	16. 00	0. 88	5. 00	0. 94	5. 00
102–10	364	175– 0	657	54–12	207	100– 2	375	98–11	364	.....	.....	58– 3	205
72– 3	256	107– 1	413	59– 9	238	110– 1	330	110– 3	380	27– 5	102	25–15	91
116– 9	431	40–10	156	115– 4	480	83–12	306	.....	.....	.....	.....	86– 4	318
97. 13	**350. 33**	**107. 56**	**408. 67**	**76. 52**	**308. 33**	**97. 98**	**337. 00**	**104. 44**	**372. 00**	**27. 31**	**102. 00**	**28. 40**	**102. 33**
.....	89	.....	172	.....	71	.....	83	.....	80	.....	.....	.....	45
.....	169	.....	294	.....	168	.....	308	.....	298	.....	43	.....	29
.....	272	.....	86	.....	195	.....	205	.....	.....	.....	.....	.....	120
.....	176. 67	.....	184. 00	.....	144. 67	.....	198. 67	.....	189. 00	.....	43. 00	.....	32. 33
.....	8	.....	7	.....	12	.....	7	.....	6	.....	.....	.....	8
.....	2	.....	3	.....	5	.....	1	.....	2	.....	12	.....	3
.....	5. 60	.....	4. 33	.....	8. 33	.....	4. 60	.....	3. 83	.....	11. 67	.....	5. 33
35– 7	130	118–3	448	128– 5	473	54– 3	193	.....	.....	39– 1	138	9– 0	34
67–13	242	121–1	454	142–12	494	92– 0	342	.....	.....	153– 5	511	38–10	136
67– 8	243	88–4	352	90– 1	340	55– 9	198	86–13	264	30– 6	106	16–13	61
10– 8	40	18–5	70	73– 4	271	121–11	444	.....	.....	201– 6	764	0– 2	1
36. 25	131. 00	86. 45	331. 00	108. 59	394. 50	80. 86	294. 25	86. 81	264. 00	60. 59	217. 00	16. 14	58. 00

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
26. Lisbon strain—Contd.												
Tree-Ripe grade—												
1913-14	21- 9	93	2- 2	11	1- 1	5	0-10	3	0-10	3	.....	.....
1914-15	87-12	346	2- 1	11	0- 0	0	0- 4	1	0-03	1	0- 0	0
1915-16	53-14	244	12-10	51	3-15	19	4- 1	23	4- 9	24	5- 3	25
1916-17	58-11	259	4- 6	22	1- 2	7	0-12	4	0- 8	2	2- 6	12
Average	55.47	235.50	5.30	23.75	1.53	7.75	1.42	7.75	1.47	7.50	2.52	12.33
Cull grade—												
1913-14	4- 0	26	1- 2	10	0- 3	1	0- 2	1	0-10	3	.....	.....
1914-15	14- 0	74	0-12	5	0- 0	0	0- 8	3	0- 4	2	0- 2	1
1915-16	22- 1	123	3- 6	16	2- 5	12	3- 6	23	0- 0	0	0-10	4
1916-17	44- 3	313	0-12	3	0-11	3	0-10	5	0- 0	0	0- 5	4
Average	21.06	134.00	1.50	8.50	0.80	4.00	1.16	8.00	0.22	1.25	0.35	3.00
Total crop—												
1913-14	444- 4	1,663	18-10	73	6- 7	26	2- 6	9	13- 9	57	.....	.....
1914-15	827- 5	3,007	10-15	49	7- 4	28	9- 6	39	41- 2	152	45- 7	164
1915-16	586-13	2,211	51- 1	196	22-11	96	8-12	51	10- 2	44	22-15	90
1916-17	561- 0	2,289	18-15	80	5- 7	25	4- 5	20	7- 2	25	8- 9	39
Average	**604. 84**	**2,292. 50**	**24. 89**	**99. 50**	**10. 45**	**43. 75**	**6. 20**	**29. 75**	**17. 98**	**69. 50**	**25. 65**	**97. 67**
Variable fruits—												
1913-14	.....	453	.....	9	.....	1	.....	0	.....	14	.....	.....
1914-15	.....	409	.....	12	.....	3	.....	3	.....	19	.....	20
1915-16	.....	1,273	.....	37	.....	11	.....	0	.....	4	.....	15
1916-17	.....	877	.....	32	.....	9	.....	1	.....	8	.....	9
Average	.....	753. 00	.....	22. 50	.....	6. 00	.....	1. 00	.....	11. 25	.....	14. 67
Average seeds per fruit—												
1913-14	.....	2. 07	.....	2	.....	3	.....	1	.....	2	.....	.....
1914-15	.....	1. 43	.....	2	.....	0	.....	2	.....	0	.....	0
1915-16	.....	2. 79	.....	5	.....	6	.....	3	.....	4	.....	2
Average	.....	2. 13	.....	3. 00	.....	3. 71	.....	2. 00	.....	1. 75	.....	1. 20
29. Open strain:												
Green grade—												
1913-14	483- 1	1,780	20-15	71	17- 6	70	3-15	17	6- 7	27	.....	.....
1914-15	541- 5	1,971	13- 1	55	1-13	8	4- 3	16	24- 5	95	18- 0	65
1915-16	368- 4	1,310	82-12	306	19-11	78	1-10	7	4-15	19	9-12	35
1916-17	307- 5	1,157	17-15	64	5- 5	20	5- 0	18	5- 5	20	3-12	15
Average	424. 98	1,554. 50	33. 67	124. 00	11. 05	44. 00	3. 69	14. 50	10. 25	40. 25	10. 50	38. 33
Tree-Ripe grade—												
1913-14	52- 9	220	2-12	13	0-14	4	2- 0	12	5-10	28	.....	.....
1914-15	177-12	736	2-12	14	1- 0	6	3-12	20	0-11	3	0-15	5
1915-16	75- 0	334	17- 2	69	8- 7	37	8- 9	41	9- 1	46	7- 6	39
1916-17	122-11	552	3- 0	18	1- 5	6	0- 0	0	9- 2	40	3- 8	18
Average	107. 00	460. 50	6. 41	28. 50	2. 91	13. 25	3. 58	18. 25	6. 13	29. 25	3. 95	20. 67
Cull grade—												
1913-14	15- 2	110	1-10	15	1- 0	6	1- 2	12	4-15	35	.....	.....
1914-15	36- 7	210	1- 0	6	3-12	24	0- 8	3	0- 5	2	0- 8	3
1915-16	60- 2	321	27- 6	132	7-14	43	9-12	63	1- 5	7	1- 0	8
1916-17	121- 3	780	1-11	8	0- 7	3	0-14	5	0-11	5	1-14	16
Average	58. 22	355. 25	7. 92	40. 25	3. 27	19. 00	3. 06	20. 75	1. 81	12. 25	1. 12	9. 00
Total crop—												
1913-14	550-12	2,110	25- 5	99	19- 4	80	7- 1	41	17- 0	90	.....	.....
1914-15	755- 8	2,917	16-13	75	6- 9	38	8- 7	39	25- 5	100	19- 7	73
1915-16	503- 6	1,965	127- 4	507	36- 0	158	19-15	111	15- 5	72	18- 2	82
1916-17	551- 3	2,489	22-10	90	7- 1	29	5-14	23	15- 2	65	9- 2	49
Average	**590. 20**	**2,370. 25**	**48. 00**	**192. 75**	**17. 22**	**76. 25**	**10. 33**	**53. 50**	**18. 19**	**81. 75**	**15. 56**	**68. 00**
Variable fruits—												
1913-14	.....	273	.....	9	.....	1	.....	0	.....	1	.....	.....
1914-15	.....	230	.....	14	.....	0	.....	1	.....	4	.....	5
1915-16	.....	812	.....	33	.....	12	.....	5	.....	6	.....	12
1916-17	.....	575	.....	40	.....	3	.....	3	.....	4	.....	0
Average	.....	472. 50	.....	24. 00	.....	4. 00	.....	2. 25	.....	3. 75	.....	5. 67

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
2- 3	11	0- 8	3	4- 5	16	5- 0	19	.....	.....	3- 9	15	1- 9	7
3-15	15	17- 4	69	18- 0	69	20- 2	77	.....	.....	20- 5	80	5-10	23
5-11	26	0- 8	2	1- 0	6	0- 0	0	3- 9	14	8- 4	34	4- 8	20
0-12	4	2- 7	10	4- 9	18	7-10	31	.....	.....	34- 3	149	0- 0	0
2.51	11.20	5.17	21.00	6.97	27.25	8.19	31.75	3.56	14.00	9.47	39.71	2.92	12.50
0- 6	3	0- 0	0	0-15	4	0- 6	2	.....	.....	0- 2	1	0- 2	1
0- 1	1	1- 5	6	4- 7	22	2- 6	12	.....	.....	2- 6	13	1-13	9
0- 9	6	0-11	4	5-14	33	0- 9	3	1-11	8	2- 9	12	0- 7	2
0- 4	2	1-13	15	14- 0	105	3- 0	23	.....	.....	10- 2	54	12-10	99
0.25	2.40	0.95	6.25	6.31	41.00	1.58	10.00	1.69	8.00	2.17	11.43	3.75	27.75
38- 0	144	118-11	451	133- 9	493	59- 9	214	.....	.....	42-12	154	10-11	42
71-13	258	139-10	529	165- 3	585	114- 8	431	.....	.....	176- 0	604	46- 1	168
73-12	275	89- 7	358	96-15	379	56- 2	201	92- 1	286	41- 3	152	21-12	83
11- 8	46	22- 9	95	91-13	394	132- 5	498	.....	.....	245-11	967	12-12	100
39.01	**144.60**	**92.58**	**358.25**	**121.88**	**462.75**	**90.63**	**336.00**	**92.06**	**286.00**	**72.23**	**268.14**	**22.81**	**98.25**
.....	17	.....	115	.....	149	.....	80	.....	.....	.....	49	.....	19
.....	26	.....	46	.....	72	.....	45	.....	.....	.....	125	.....	38
.....	179	.....	273	.....	294	.....	152	.....	213	.....	58	.....	37
.....	31	.....	56	.....	164	.....	313	.....	.....	.....	253	.....	1
.....	50.60	.....	122.50	.....	169.75	.....	147.50	.....	213.00	.....	69.29	.....	23.75
.....	2	.....	3	.....	2	.....	2	.....	.....	.....	1	.....	3
.....	0	.....	1	.....	2	.....	1	.....	.....	.....	4	.....	2
.....	0	.....	2	.....	1	.....	0	.....	0	.....	2	.....	7
.....	0.78	.....	1.88	.....	1.78	.....	1.38	.....	0	.....	2.67	.....	3.78
31- 2	116	103- 8	395	173- 1	624	54- 1	191	.....	.....	52- 4	189	20- 6	80
27-12	161	57-13	219	73- 1	261	109-14	403	.....	.....	78- 2	283	133- 5	465
21-12	70	48- 1	174	52-13	191	53- 0	182	43- 2	141	21- 7	74	9- 5	33
26- 2	105	13- 7	53	43-13	166	81-15	300	.....	.....	104- 7	395	0- 4	1
21.35	78.40	55.70	210.25	85.69	310.50	74.72	269.00	43.13	141.00	36.61	134.43	40.81	144.75
2- 8	11	0-12	3	20- 9	77	4- 9	19	.....	.....	9- 8	39	3- 7	14
10- 5	40	23-13	97	24- 5	93	30-14	122	.....	.....	30-12	135	48- 9	201
2- 6	12	2- 2	11	1- 8	8	0- 0	0	3- 6	12	11- 7	44	3-10	15
5- 7	20	8- 4	40	19-14	77	18- 4	82	.....	.....	53-15	251	0- 0	0
4.12	16.60	8.73	37.75	16.56	63 75	13.42	55.75	3.38	12.00	15.09	67.00	13.91	57.50
0- 3	2	1- 6	7	0-10	5	1-15	12	.....	.....	1-12	12	0- 9	4
0- 9	4	2- 0	8	3-15	20	5- 4	32	.....	.....	9-12	55	8-14	53
0- 5	2	0-12	5	3-12	19	1- 3	7	4- 0	22	1- 7	7	1- 6	6
0-10	5	2-10	22	21- 1	136	8-10	65	.....	.....	51-10	287	31- 1	228
0.34	2.60	1.69	10.50	7.34	45.00	4.25	29.00	4.00	22.00	9.22	51.57	10.47	72.75
33-13	129	105-10	405	194- 4	706	60- 9	222	.....	.....	63- 8	240	24- 6	98
38-10	145	83-10	324	101- 5	374	146- 0	557	.....	.....	118-10	473	190-12	719
24- 7	84	50-15	190	58- 1	218	54- 3	189	50- 8	175	34- 5	125	14- 5	54
32- 3	130	24- 5	115	84-12	379	108-13	447	.....	.....	210- 0	933	31- 5	229
25.81	**97.60**	**66.13**	**258.50**	**109.59**	**419.25**	**92.39**	**353.75**	**50.50**	**175.00**	**60.91**	**253.00**	**65.19**	**275.00**
.....	24	.....	48	.....	113	.....	42	.....	.....	.....	32	.....	3
.....	7	.....	11	.....	14	.....	53	.....	.....	.....	44	.....	77
.....	45	.....	146	.....	162	.....	162	.....	103	.....	88	.....	38
.....	45	.....	35	.....	106	.....	196	.....	.....	.....	140	.....	3
.....	24.20	.....	60.00	.....	98.75	.....	113.25	.....	103.00	.....	43.43	.....	30.25

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
29. Open strain—Contd.												
Average seeds per fruit—												
1913–14	.....	3.13	.....	3	.....	3	.....	3	.....	1	.....	.....
1914–15	.....	4.76	.....	6	.....	3	.....	4	.....	1	.....	1
1915–16	.....	5.86	.....	10	.....	5	.....	7	.....	5	.....	3
Average	.....	4.65	.....	6.11	.....	3.44	.....	4.89	.....	2.11	.....	2.00
39. Open strain:												
Green grade—												
1913–14	507–0	1,903	23–1	82	10–15	41	1–9	6	6–5	26	.....	.....
1914–15	462–15	1,680	21–0	85	6–1	26	5–12	25	3–7	14	8–6	30
1915–16	245–12	880	57–14	212	14–10	58	4–6	17	2–7	9	1–11	6
1916–17	358–12	1,330	8–12	36	8–2	30	4–4	16	5–3	19	10–8	41
Average	393.61	1,448.25	27.67	103.75	9.94	38.75	3.98	16.00	4.34	17.00	6.85	25.67
Tree-Ripe grade—												
1913–14	63–12	286	1–3	5	2–8	12	1–3	7	7–10	45	.....	.....
1914–15	209–11	881	5–9	25	1–8	9	3–13	21	0–9	3	4–12	26
1915–16	75–10	352	24–11	101	4–12	22	18–7	89	8–5	52	4–0	21
1916–17	87–13	381	3–1	18	1–6	7	0–0	0	10–2	43	4–4	22
Average	109.22	475.00	8.63	37.25	2.53	12.50	5.86	29.25	6.66	35.75	4.33	23.00
Cull grade—												
1913–14	16–14	120	0–14	8	0–2	1	0–3	1	7–3	53	.....	.....
1914–15	41–6	241	1–10	9	4–6	26	2–8	16	0–0	0	0–13	6
1915–16	54–8	327	20–3	105	8–8	69	13–2	80	1–6	9	1–2	9
1916–17	95–7	596	1–6	8	0–8	3	0–10	4	0–0	0	0–12	6
Average	52.05	321.00	6.02	32.50	3.38	24.75	4.11	25.25	2.14	15.50	0.90	7.00
Total crop—												
1913–14	587–10	2,309	25–2	95	13–9	54	2–15	14	21–2	124	.....	.....
1914–15	714–0	2,802	28–3	119	11–15	61	12–1	62	4–0	17	13–15	62
1915–16	375–14	1,559	102–12	418	27–14	149	35–15	186	12–2	70	6–13	36
1916–17	542–0	2,307	13–3	62	10–0	40	4–14	20	15–5	62	15–8	69
Average	554.88	2,244.25	42.31	173.50	15.84	76.00	13.95	70.50	13.14	68.25	12.08	55.67
Variable fruits—												
1913–14	.....	431	.....	18	.....	3	.....	0	.....	0	.....	.....
1914–15	.....	320	.....	24	.....	3	.....	2	.....	1	.....	2
1915–16	.....	600	.....	63	.....	22	.....	4	.....	0	.....	4
1916–17	.....	640	.....	39	.....	10	.....	8	.....	5	.....	22
Average	.....	497.75	.....	36.00	.....	9.50	.....	3.50	.....	1.50	.....	9.33
Average seeds per fruit—												
1913–14	.....	3.90	.....	0	.....	5	.....	2	.....	1	.....	.....
1914–15	.....	6.00	.....	3	.....	3	.....	6	.....	4	.....	6
1915–16	.....	5.71	.....	5	.....	5	.....	4	.....	6	.....	6
Average	.....	5.25	.....	2.78	.....	4.33	.....	4.22	.....	3.75	.....	6.17
50. Open strain:												
Green grade—												
1913–14	411–13	1,552	10–6	36	10–6	42	3–13	17	4–0	17	.....	.....
1914–15	411–10	1,540	18–4	77	4–1	19	2–1	9	5–9	23	10–10	41
1915–16	280–7	1,013	35–15	140	19–1	74	0–12	3	1–4	5	1–6	5
1916–17	324–11	1,242	14–15	612	0–12	11	4–12	17	5–4	18	2–13	12
Average	357.14	1,336.75	19.87	78.50	9.06	36.50	2.84	11.50	4.01	15.75	4.94	19.33
Tree-Ripe grade—												
1913–14	86–6	375	1–4	6	1–11	9	2–0	13	5–11	33	.....	.....
1914–15	232–3	1,014	7–7	36	1–0	6	5–15	30	1–7	8	0–14	4
1915–16	73–12	363	13–12	57	11–10	58	6–10	33	11–12	70	0–13	5
1916–17	94–11	446	4–14	28	1–2	7	0–4	2	14–5	62	7–3	35
Average	121.75	549.50	6.83	31.75	3.86	20.00	3.70	19.50	8.30	43.25	2.96	14.67
Cull grade—												
1913–14	19–6	149	0–6	3	1–2	6	1–2	9	6–4	54	.....	.....
1914–15	45–0	265	4–4	27	2–13	21	1–9	11	0–8	4	0–12	5
1915–16	53–6	325	17–9	108	11–13	62	10–6	64	1–0	9	1–8	14
1916–17	102–3	685	2–8	13	0–5	2	1–4	8	0–14	7	1–3	9
Average	54.98	356.00	6.17	37.75	4.02	22.75	3.58	23.00	2.16	18.50	1.15	9.33

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
.....	4	.....	3	.....	3	.....	6	.....	.....	.....	4	.....	2
.....	8	.....	5	.....	3	.....	8	.....	.....	.....	7	.....	6
.....	6	.....	8	.....	5	.....	3	.....	3	.....	10	.....	3
.....	5.89	.....	5.56	.....	3.78	.....	6.38	.....	3.00	.....	7.11	.....	3.78
25– 0	94	85– 6	336	176– 8	632	92– 9	356	.....	.....	64– 5	246	21– 6	84
26– 3	96	24–12	94	73– 2	257	62– 0	231	.....	.....	151– 4	534	81– 0	288
9–14	34	25– 0	91	36–12	133	27– 9	94	34– 8	118	21–14	76	9– 3	32
22–13	89	12– 8	49	90– 2	335	83–15	305	.....	.....	112– 9	410	0– 0	0
16.78	62.60	36.91	142.50	94.13	339.25	66.52	246.50	34.50	118.00	50.00	180.86	27.89	101.00
5– 6	30	4– 9	19	15– 3	57	13– 0	54	.....	.....	9– 6	41	3–12	16
14– 2	53	30– 0	120	28– 3	109	36– 3	145	.....	.....	52–14	232	32– 2	138
0– 6	2	0–15	5	1– 0	5	0– 0	0	4– 5	17	7– 4	30	1– 9	8
1– 8	7	2– 0	10	14– 0	53	16–13	69	.....	.....	34–11	152	0– 0	0
4.28	18.40	9.38	38.50	14.59	56.00	16.50	67.00	4.31	17.00	14.88	65.00	9.36	40.50
0– 6	4	0–12	3	2–12	16	1– 7	10	.....	.....	3– 0	22	0– 3	2
0– 8	3	1–15	12	6–12	35	5– 6	30	.....	.....	13– 0	79	4– 8	25
0– 0	0	1–11	9	3– 2	18	0– 6	3	2– 3	11	1– 4	7	1– 9	7
0–15	8	1– 4	8	23– 5	157	4– 8	32	.....	.....	37– 0	189	25– 3	181
0.36	3.00	1.41	8.00	8.98	56.50	2.92	18.75	2.18	11.00	7.75	42.43	7.86	53.75
30–12	128	90–11	358	194– 7	705	107– 0	420	.....	.....	76–11	309	25– 5	102
40–13	152	56–11	226	108– 1	401	103– 9	406	.....	.....	217– 2	845	117–10	451
10– 4	36	27–10	105	40–14	156	27–15	97	41– 0	146	30– 6	113	12– 5	47
25– 4	104	15–12	67	127– 7	545	105– 4	406	.....	.....	184– 4	751	25– 3	181
21.41	**84.00**	**47.69**	**189.00**	**117.70**	**451.75**	**85.94**	**332.25**	**41.00**	**146.00**	**72.63**	**288.28**	**45.11**	**195.25**
.....	8	.....	74	.....	136	.....	157	.....	.....	.....	23	.....	12
.....	15	.....	15	.....	59	.....	35	.....	.....	.....	102	.....	62
.....	29	.....	84	.....	119	.....	81	.....	95	.....	68	.....	31
.....	38	.....	25	.....	152	.....	196	.....	.....	.....	145	.....	0
.....	18.00	.....	49.50	.....	116.50	.....	117.25	.....	95.00	.....	48.29	.....	26.25
.....	6	.....	8	.....	4	.....	5	.....	.....	.....	3	.....	4
.....	6	.....	6	.....	10	.....	5	.....	.....	.....	7	.....	8
.....	6	.....	7	.....	8	.....	6	.....	5	.....	5	.....	5
.....	5.88	.....	7.11	.....	7.44	.....	5.33	.....	5.00	.....	5.22	.....	5.78
6– 4	24	55–15	220	147–10	529	59– 4	229	.....	.....	84–11	322	29– 8	116
9– 5	34	55– 2	211	57–13	209	64–12	241	99– 1	366	.....	.....	85– 0	310
14– 1	47	37– 7	135	30– 3	112	41–13	145	40– 2	141	36– 4	127	22– 3	79
10– 5	41	8–15	35	58– 0	226	79– 1	296	.....	.....	137–14	525	0– 0	0
7.99	29.20	39.36	150.25	73.41	269.00	61.22	227.75	69.59	253.50	51.76	194.80	34.17	126.25
0– 0	0	4–12	21	34–12	137	3– 4	14	.....	.....	21–10	92	11– 6	50
7– 6	28	28– 3	116	13–10	55	52– 3	205	88– 2	408	.....	.....	26– 0	118
8–13	41	5–10	34	2– 4	12	0– 0	0	1– 3	5	4–13	20	6– 8	28
1–10	8	1–12	9	4– 6	18	7– 1	29	.....	.....	49– 6	236	2–12	12
3.56	15.40	10.08	45.00	13.75	55.50	15.63	62.00	44.65	206.50	15.16	69.60	11.66	52.00
0– 5	3	0–15	7	3– 9	26	2–10	20	.....	.....	1–12	13	1– 5	8
0–10	5	2– 9	15	6– 0	28	8– 3	44	12–14	70	.....	.....	4–14	35
1–13	10	0–14	8	2– 2	14	0–12	5	2– 0	11	1– 1	8	2– 8	12
1– 8	11	3– 0	24	22– 9	168	11–12	82	.....	.....	41– 6	231	15–14	130
0.85	5.80	1.84	13.50	8.56	59.00	5.83	37.75	7.44	40.50	8.84	50.40	6.14	46.25

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
50. Open strain—Contd.												
Total crop—												
1913–14	517– 9	2,076	12– 0	45	13– 3	57	6–15	39	15–15	104	.....	.....
1914–15	688–13	2,819	29–15	140	7–14	46	9– 9	50	7– 8	35	12– 4	50
1915–16	407– 9	1,701	67– 4	305	42– 8	194	17–12	100	14– 0	84	3–11	24
1916–17	521– 9	2,373	22– 5	102	4– 3	20	6– 4	27	20– 7	87	11– 3	56
Average	**533. 88**	**2,242. 25**	**32. 88**	**148. 00**	**16. 94**	**79. 25**	**10. 12**	**54. 00**	**14. 47**	**77. 50**	**9. 04**	**43. 33**
Variable fruits—												
1913–14	.....	250	.....	0	.....	0	.....	0	.....	0	.....	.....
1914–15	.....	226	.....	23	.....	2	.....	2	.....	0	.....	1
1915–16	.....	703	.....	31	.....	14	.....	1	.....	0	.....	1
1916–17	.....	573	.....	53	.....	7	.....	3	.....	8	.....	5
Average	.....	438. 00	.....	26. 75	.....	5. 75	.....	1. 50	.....	2. 00	.....	2. 33
Average seeds per fruit—												
1913–14	.....	4. 07	.....	6	.....	4	.....	2	.....	2	.....	.....
1914–15	.....	5. 30	.....	3	.....	4	.....	4	.....	2	.....	4
1915–16	.....	5. 31	.....	8	.....	9	.....	6	.....	6	.....	6
Average	.....	4. 94	.....	5. 78	.....	5. 44	.....	4. 11	.....	3. 44	.....	5. 00
57. Bull strain:												
Green grade—												
1914–15	620– 8	2,201	1– 8	6	.....	(1)	29–15	113	120– 2	422	57– 0	199
1915–16	419–10	1,537	9– 1	33	3–15	15	2– 1	7	3– 0	11	17– 7	61
1916–17	321– 9	1,132	7– 6	28	1– 1	4	3–11	12	31– 6	107	49– 4	170
Average	453. 89	1,623. 33	5. 97	22. 33	2. 50	9. 50	11. 89	44. 00	51. 50	180. 00	41. 23	143. 33
Tree-Ripe grade—												
1914–15	55– 8	219	0– 6	2	.....	(1)	0– 6	2	0– 3	1	0– 3	1
1915–16	69– 4	322	1– 4	5	2– 8	14	4– 4	23	1– 7	7	0– 7	2
1916–17	28–10	130	4– 6	25	2– 2	14	1– 0	5	0– 6	2	0– 8	2
Average	51. 12	223. 66	2. 00	10. 67	2. 31	14. 00	1. 87	10. 00	0. 67	3. 33	0. 38	1. 67
Cull grade—												
1914–15	7–12	47	0– 2	1	.....	(1)	0– 9	4	0– 8	3	0– 0	0
1915–16	18–15	115	0–12	4	1– 4	7	0–13	7	0– 0	0	0– 0	0
1916–17	32–13	200	1– 8	11	1– 8	9	0–13	6	0– 0	0	0– 0	0
Average	19. 83	120. 66	0. 79	5. 33	1. 38	8. 00	0. 17	5. 67	0. 17	1. 00	0	0
Total crop—												
1914–15	683–12	2,467	2– 0	9	.....	(1)	30–14	119	120–13	426	57– 3	200
1915–16	507–13	1,974	11– 1	42	7–11	36	7– 2	37	4– 7	18	17–14	63
1916–17	383– 0	1,462	13– 4	64	4–11	27	5– 8	23	31–12	109	49–12	172
Average	**524. 85**	**1,967. 67**	**8. 77**	**38. 33**	**6. 19**	**31. 50**	**14. 50**	**59. 67**	**52. 33**	**184. 33**	**41. 60**	**145. 00**
Variable fruits—												
1914–15	.....	786	.....	7	.....	(1)	.....	47	.....	127	.....	53
1915–16	.....	1,251	.....	15	.....	0	.....	3	.....	5	.....	40
1916–17	.....	795	.....	28	.....	5	.....	8	.....	71	.....	120
Average	.....	944. 00	.....	16. 67	.....	1. 67	.....	19. 33	.....	67. 67	.....	71. 00
Average seeds per fruit—												
1914–15	.....	2. 89	.....	3	.....	(1)	.....	4	.....	1	.....	0
1915–16	.....	3. 39	.....	8	.....	0	.....	3	.....	6	.....	6
Average	.....	3. 15	.....	5. 83	.....	0	.....	3. 83	.....	3. 50	.....	3. 25
59. Open strain:												
Green grade—												
1913–14	483–11	1,817	22– 7	83	15– 7	59	3–11	13	4– 8	18	.....	.....
1914–15	481– 4	1,728	23– 5	94	1– 6	6	1–11	7	14–12	56	29– 1	105
1915–16	257– 7	926	44–10	157	17– 0	65	6–15	27	5–12	21	4– 6	16
1916–17	243– 1	930	10–14	44	6–11	25	0– 9	2	4– 2	13	6–15	27
Average	366. 36	1,350. 25	25. 31	94. 50	10. 13	38. 75	3. 22	12. 25	7. 28	27. 00	13. 46	49. 33

[1] Fruit picked in August was carried away without being recorded.

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
6– 9	27	61–10	248	185–15	692	65– 2	263	.....	.....	108– 1	427	42– 3	174
17– 5	67	85–14	342	77– 7	292	125– 2	490	200– 1	844	.....	.....	115–14	463
24–11	98	43–15	177	34– 9	138	42– 9	150	43– 5	157	42– 2	155	31– 3	119
13– 7	60	13–11	68	84–15	412	97–14	407	.....	.....	228–10	992	18–10	142
12. 40	**50. 40**	**51. 28**	**208. 75**	**95. 72**	**383. 50**	**82. 67**	**327. 50**	**121. 68**	**500. 50**	**75. 76**	**314. 80**	**51. 97**	**224. 50**
.....	2	.....	38	.....	106	.....	59	.....	.....	.....	31	.....	14
.....	3	.....	17	.....	16	.....	37	.....	76	.....	.....	.....	49
.....	24	.....	95	.....	96	.....	130	.....	115	.....	106	.....	90
.....	21	.....	14	.....	99	.....	172	.....	.....	.....	188	.....	3
.....	10. 00	.....	41. 00	.....	79. 25	.....	99. 50	.....	95. 50	.....	65. 00	.....	31. 20
.....	3	.....	4	.....	5	.....	7	.....	.....	.....	5	.....	3
.....	9	.....	7	.....	4	.....	6	.....	6	.....	.....	.....	7
.....	4	.....	3	.....	3	.....	6	.....	6	.....	4	.....	2
.....	5. 75	.....	4. 89	.....	4. 22	.....	6. 12	.....	6. 33	.....	4. 50	.....	4. 22
89– 7	314	107– 0	392	47– 3	167	78–11	278	45–14	160	.....	.....	43–12	150
52–13	185	83– 4	331	54– 9	212	61– 5	220	78–15	276	22– 2	77	31– 2	109
61–10	220	31– 9	115	55–14	199	45– 5	159	.....	.....	.....	.....	34– 7	118
67. 96	239. 67	73. 94	279. 33	52. 54	192. 67	61. 77	219. 00	62. 41	218. 00	22. 13	77. 00	18. 22	62. 83
8–10	31	13– 1	50	4–10	17	9– 8	37	13– 8	56	.....	.....	5– 1	22
1–10	8	2–12	15	6–10	36	0– 6	2	6– 3	23	12–11	52	29– 2	135
1–13	7	3–13	15	1– 6	5	2– 9	10	.....	.....	.....	.....	10–11	45
4. 02	15. 33	6. 54	26. 67	4. 21	19. 33	4. 15	16. 33	9. 84	39. 50	12. 69	52. 00	7. 48	33. 67
1–14	10	0– 8	2	1– 6	8	0– 9	3	1–14	14	.....	.....	0– 6	2
1– 0	7	0–10	3	2– 8	14	2– 2	13	4– 4	26	3–14	22	1–12	12
0– 3	1	2– 6	13	20–12	126	1– 7	11	.....	.....	.....	.....	4– 4	23
1. 02	6. 00	1. 17	6. 00	8. 21	49. 33	1. 37	9. 00	3. 06	20. 00	3. 88	22. 00	1. 06	6. 17
99–15	355	120– 9	444	53– 3	192	88–12	318	61– 4	230	.....	.....	49– 3	174
55– 7	200	86–10	349	63–11	262	63–13	235	89– 6	325	38–11	151	62– 0	256
63–10	228	37–12	143	78– 0	330	49– 5	180	.....	.....	.....	.....	49– 6	186
73. 00	**261. 00**	**81. 64**	**312. 00**	**64. 96**	**261. 33**	**67. 29**	**244. 33**	**75. 31**	**277. 50**	**38. 69**	**151. 00**	**26. 76**	**102. 67**
.....	108	.....	153	.....	73	.....	97	.....	71	.....	.....	.....	50
.....	145	.....	250	.....	183	.....	202	.....	202	.....	78	.....	128
.....	162	.....	91	.....	130	.....	123	.....	.....	.....	.....	.....	57
.....	138. 33	.....	164. 67	.....	128. 67	.....	140. 67	.....	136. 50	.....	78. 00	.....	39. 17
.....	2	.....	3	.....	3	.....	5	.....	4	.....	.....	.....	2
.....	1	.....	5	.....	1	.....	2	.....	0	.....	1	.....	4
.....	1. 50	.....	4. 00	.....	1. 83	.....	3. 67	.....	2. 33	.....	1. 33	.....	2. 83
13–10	52	76–13	300	150– 5	549	93– 3	346	.....	.....	76– 5	289	27– 6	108
22–12	81	45– 7	168	63– 3	220	75– 0	276	.....	.....	138–14	483	65–13	232
22–12	76	55– 5	132	27– 3	103	38–10	135	28– 7	102	11– 2	39	15– 5	53
16– 2	62	4– 2	16	51– 6	185	57– 2	240	.....	.....	84–13	315	0– 5	1
15. 05	54. 20	40. 42	154. 00	73. 02	264. 25	65. 98	249. 25	28. 44	102. 00	44. 45	160. 86	27. 20	98. 50

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
59. Open strain—Contd.												
Tree-Ripe grade—												
1913–14	77- 2	344	1- 0	5	1-15	9	1-14	12	9-10	53	.....	.....
1914–15	190- 7	778	5- 8	28	0-12	5	3-10	20	0- 4	1	4- 0	19
1915–16	103-13	476	20- 7	81	7- 5	33	23- 2	106	14- 1	83	1- 3	7
1916–17	73- 9	313	2- 4	13	0- 5	2	0- 3	1	7- 5	30	1- 9	8
Average	111.23	477.75	7.30	31.75	2.58	12.25	7.20	34.75	7.81	41.75	2.25	11.33
Cull grade—												
1913–14	15-10	111	0- 4	1	0- 8	4	0-14	8	8- 7	57	.....	.....
1914–15	27- 2	151	2- 9	16	3- 2	21	0- 7	2	0- 6	2	0- 2	1
1915–16	48- 3	264	11- 6	55	10- 4	52	11- 6	70	0-10	4	1- 3	9
1916–17	88-10	571	0- 9	3	0- 0	0	0- 6	3	0- 3	1	0- 7	3
Average	44.89	274.25	3.69	18.75	3.47	19.25	3.27	20.75	2.41	16.00	0.58	4.33
Total crop—												
1913–14	576- 7	2,272	23-11	89	17-14	72	6- 7	33	22- 9	128	.....	.....
1914–15	698-13	2,657	31- 6	138	5- 4	32	5-12	29	15- 6	59	33- 3	125
1915–16	409- 7	1,666	76- 7	293	34- 9	150	41- 7	203	20- 7	108	6-12	32
1916–17	405- 4	1,814	13-11	60	7- 0	27	1- 2	6	11-10	44	8-15	38
Average	522.48	2,102.25	36.30	145.00	16.17	70.25	13.69	67.75	17.50	84.75	16.29	65.00
Variable fruits—												
1913–14	.....	363	.....	6	.....	2	.....	0	.....	0	.....	.....
1914–15	.....	270	.....	36	.....	0	.....	1	.....	1	.....	13
1915–16	.....	631	.....	42	.....	6	.....	19	.....	3	.....	7
1916–17	.....	549	.....	31	.....	5	.....	3	.....	0	.....	11
Average	.....	453.25	.....	28.75	.....	3.25	.....	5.75	.....	1.00	.....	10.33
Average seeds per fruit—												
1913–14	.....	3.00	.....	1	.....	2	.....	2	.....	1	.....	.....
1914–15	.....	5.91	.....	5	.....	4	.....	4	.....	6	.....	4
1915–16	.....	4.71	.....	8	.....	7	.....	6	.....	4	.....	5
Average	.....	4.33	.....	5.12	.....	4.22	.....	4.11	.....	4.00	.....	4.50
67. Open strain:												
Green grade—												
1913–14	387- 4	1,446	20-15	71	12- 0	50	1-14	8	8-12	36	.....	.....
1914–15	342- 8	1,256	13- 0	55	3- 6	15	2-11	11	4- 7	18	2- 7	9
1915–16	228- 5	833	52- 3	194	19-12	78	2- 9	10	3- 5	13	1- 8	6
1916–17	293- 7	1,085	12- 4	50	3- 3	12	4-14	18	3- 0	11	3- 6	13
Average	312.88	1,155.00	24.59	92.50	9.58	38.75	3.00	11.75	4.88	19.50	2.44	9.33
Tree-Ripe grade—												
1913–14	108-14	489	1-15	9	0- 9	4	1- 0	6	11-10	68	.....	.....
1914–15	196-15	859	5-11	28	1-10	10	4- 8	27	0-10	4	2- 6	14
1915–16	85- 7	413	17-10	72	16- 5	73	22- 9	116	5-12	34	4-12	27
1916–17	106- 0	469	4- 6	24	0-11	4	0- 0	0	8- 2	36	3- 1	13
Average	124.31	557.50	7.41	33.25	4.80	22.75	7.01	37.25	6.53	35.50	3.40	18.00
Cull grade—												
1913–14	18- 2	130	0- 1	1	0-10	5	0-14	7	8- 2	62	.....	.....
1914–15	64- 5	384	1- 7	9	2- 4	17	0-15	8	0- 6	3	0- 7	3
1915–16	80-15	460	27- 4	148	17-14	98	22-12	131	0-14	6	1- 0	8
1916–17	97-11	632	1-10	9	0- 2	1	0- 8	4	1- 1	7	2- 8	24
Average	65.26	401.50	7.59	41.75	5.22	30.25	6.27	37.50	2.61	19.50	1.31	11.67
Total crop—												
1913–14	514- 4	2,065	22-15	81	13- 3	59	3-12	21	28- 8	166	.....	.....
1914–15	603-12	2,499	20- 2	92	7- 4	42	8- 2	46	5- 7	25	5- 4	26
1915–16	394-11	1,706	97- 1	414	53-15	249	47-14	257	9-15	53	7- 4	41
1916–17	497- 2	2,186	18- 4	83	4- 0	17	5- 6	22	12- 3	54	8-15	50
Average	502.45	2,114.00	39.59	167.50	19.59	91.75	16.28	86.50	14.01	74.50	7.14	39.00
Variable fruits—												
1913–14	.....	192	.....	0	.....	0	.....	0	.....	1	.....	.....
1914–15	.....	181	.....	17	.....	1	.....	0	.....	1	.....	0
1915–16	.....	530	.....	29	.....	21	.....	2	.....	3	.....	1
1916–17	.....	462	.....	47	.....	2	.....	2	.....	1	.....	3
Average	.....	341.25	.....	23.25	.....	6.00	.....	1.00	.....	1.50	.....	1.33

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
9– 2	51	2–10	11	27– 0	103	11– 2	45	.....	.....	9– 0	39	3–13	16
8– 4	31	39– 6	157	28–12	110	44– 2	170	.....	.....	36– 6	157	19– 7	80
9– 8	40	4– 2	22	1–12	9	0– 8	3	0– 4	1	11– 7	47	10– 2	44
0– 9	4	1– 0	5	17– 0	64	12– 6	50	.....	.....	31– 0	136	0– 0	0
5. 49	25. 20	11. 78	48. 75	18. 63	71. 50	17. 03	67. 00	0. 25	1. 00	12. 54	54. 14	8. 34	35. 00
1–11	13	0– 4	2	0– 7	3	1– 3	9	.....	.....	1–12	12	0– 4	2
0– 4	1	2– 1	8	5– 0	29	3– 4	17	.....	.....	7–15	41	2– 0	13
0– 2	1	0– 0	0	5–13	34	0–15	5	2–11	14	3– 8	18	0– 5	2
0– 4	2	0–11	6	15– 0	109	3– 2	21	.....	.....	40– 0	211	28– 0	212
0. 46	3. 40	0. 75	4. 00	6. 56	43. 75	2. 13	13. 00	2. 69	14. 00	7. 60	40. 29	7. 64	57. 25
24– 7	116	79–11	313	177–12	655	105– 8	400	.....	.....	87– 1	340	31– 7	126
31– 4	113	86–14	333	96–15	359	122– 6	463	.....	.....	183– 3	681	87– 4	325
32– 6	117	39– 7	154	34–12	146	40– 1	143	31– 6	117	26– 1	104	25–12	99
16–15	68	5–13	27	83– 6	358	72–10	311	.....	.....	155–13	662	28– 5	213
21. 00	**82. 80**	**52. 95**	**206. 75**	**98. 20**	**379. 50**	**85. 14**	**329. 25**	**31. 38**	**117. 00**	**64. 59**	**255. 29**	**43. 19**	**190. 75**
.....	3	.....	54	.....	102	.....	134	.....	.....	.....	53	.....	9
.....	9	.....	7	.....	24	.....	54	.....	.....	.....	84	.....	41
.....	61	.....	115	.....	85	.....	114	.....	84	.....	40	.....	55
.....	30	.....	4	.....	149	.....	162	.....	.....	.....	154	.....	0
.....	20. 60	.....	45. 00	.....	90. 00	.....	116. 00	.....	84. 00	.....	47. 29	.....	26. 25
.....	4	.....	4	.....	6	.....	2	.....	.....	.....	3	.....	4
.....	3	.....	4	.....	4	.....	5	.....	.....	.....	8	.....	8
.....	2	.....	2	.....	1	.....	4	.....	5	.....	6	.....	4
.....	2. 89	.....	3. 50	.....	3. 89	.....	4. 00	.....	5. 33	.....	5. 67	.....	5. 44
8–4	30	51– 6	199	128– 2	460	66– 6	253	.....	.....	62– 2	231	27– 7	108
8–4	30	27– 7	105	53–10	190	57–12	210	.....	.....	100– 8	359	69– 0	254
5–1	18	18– 7	69	29– 4	108	26–12	96	31–13	109	23–15	83	13–12	49
16–7	62	14– 3	55	46–13	172	81–13	292	.....	.....	107– 8	400	0– 0	0
7. 60	28. 00	27. 86	107. 00	64. 45	232. 50	58. 17	212. 75	31. 81	109. 00	42. 01	153. 29	27. 55	102. 75
2–15	19	8– 3	34	27– 8	109	14–14	64	.....	.....	30– 2	131	10– 2	45
3– 4	12	21– 0	87	23– 0	89	24– 0	96	.....	.....	69– 9	308	41– 5	184
2–13	13	5–12	35	0–12	5	0– 4	2	1–12	7	3–15	16	3– 3	13
2– 5	11	2–13	12	10–14	42	28– 1	113	.....	.....	45–11	214	0– 0	0
2. 26	11. 00	9. 44	42. 00	15. 53	61. 25	16. 80	68. 75	1. 75	7. 00	21. 33	95. 57	13. 66	60. 50
0–13	6	0–12	5	1–12	13	2– 6	14	.....	.....	2–4	14	0– 8	3
0– 3	1	1– 6	8	7–14	43	8– 2	47	.....	.....	30–5	177	11– 0	68
0– 4	2	1– 5	10	3– 9	22	0–12	6	2–9	13	2–2	13	0–10	3
1– 9	12	2– 4	15	20– 0	136	3– 8	26	.....	.....	41–4	225	23– 5	173
0. 56	4. 20	1. 42	9. 50	8. 30	53. 50	3. 69	23. 25	2. 56	13. 00	10. 85	61. 28	8. 86	61. 75
12– 0	55	60– 5	238	157– 6	582	83–10	331	.....	.....	94–8	376	38– 1	156
11–11	43	49–13	200	84– 8	322	89–14	353	.....	.....	200–6	844	121– 5	506
8– 2	33	25– 8	114	33– 9	135	27–12	104	36–2	129	30–0	112	17– 9	65
20– 5	85	19– 4	82	77–11	350	113– 6	431	.....	.....	194–7	839	23– 5	173
10. 42	**43. 20**	**38. 72**	**158. 50**	**88. 29**	**347. 25**	**78. 66**	**304. 75**	**36. 13**	**129. 00**	**74. 18**	**310. 14**	**50. 07**	**225. 00**
.....	5	.....	27	.....	59	.....	69	.....	.....	.....	22	.....	9
.....	5	.....	17	.....	17	.....	23	.....	.....	.....	60	.....	40
.....	14	.....	61	.....	96	.....	79	.....	98	.....	76	.....	50
.....	24	.....	11	.....	74	.....	164	.....	.....	.....	134	.....	0
.....	9. 60	.....	29. 00	.....	61. 50	.....	83. 75	.....	98. 00	.....	41. 71	.....	24. 75

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
67. Open strain—Contd.												
Average seeds per fruit—												
1913–14	.....	3.67	.....	2	.....	2	.....	3	.....	2	.....	.....
1914–15	.....	4.64	.....	4	.....	4	.....	3	.....	2	.....	3
1915–16	.....	5.33	.....	8	.....	5	.....	7	.....	5	.....	6
Average	.....	4.60	.....	4.78	.....	3.78	.....	4.11	.....	3.22	.....	4.33
75. Open strain:												
Green grade—												
1913–14	488–13	1,813	20–13	68	20–15	84	0– 8	2	8– 8	34	.....	.....
1914–15	388– 5	1,399	13– 4	54	6–10	29	1– 8	6	15– 5	58	8– 1	30
1915–16	204– 5	785	80–10	335	19– 2	74	3–13	15	0–13	3	0– 9	2
1916–17	199– 4	744	17–10	68	2– 0	8	2– 1	8	2– 3	8	0– 0	0
Average	320.17	1,185.25	33.08	131.25	12.17	48.75	1.97	7.75	6.70	25.75	2.87	10.67
Tree-Ripe grade—												
1913–14	60– 5	272	0–14	4	1– 4	7	2–10	16	8– 1	42	.....	.....
1914–15	150– 6	638	4– 9	22	1– 1	6	2– 1	12	1– 0	6	2– 3	11
1915–16	94– 0	434	32– 2	135	13– 2	63	21– 4	103	5– 6	33	1– 8	11
1916–17	81–11	367	7– 3	37	2– 0	13	0–10	3	8– 3	37	1–12	8
Average	96.59	427.75	11.19	49.50	4.36	22.25	6.64	33.50	5.66	29.50	1.81	10.00
Cull grade—												
1913–14	18–10	136	0– 8	4	0– 7	4	0– 8	4	12– 8	91	.....	.....
1914–15	44–13	259	1–12	11	4– 5	26	2– 1	13	0– 4	2	0– 8	4
1915–16	70– 7	402	24– 6	126	14– 3	78	17– 2	108	1– 2	8	0–12	6
1916–17	119–12	841	3–10	18	0– 8	4	0–10	5	0– 6	3	0–13	9
Average	63.40	409.50	7.56	39.75	4.86	28.00	5.08	32.50	3.56	26.00	0.69	6.33
Total crop—												
1913–14	567–12	2,221	22– 3	76	22–10	95	3–10	22	29– 1	167	.....	.....
1914–15	583– 8	2,296	19– 9	87	12– 0	61	5–10	31	16– 9	66	10–12	45
1915–16	368–12	1,621	137– 2	596	46– 7	215	42– 3	226	7– 5	44	2–13	19
1916–17	400–11	1,952	28– 7	123	4– 8	25	3– 5	16	10–12	48	2– 9	17
Average	480.17	2,022.50	51.83	220.50	21.39	99.00	13.69	73.75	15.92	81.25	5.37	27.00
Variable fruits—												
1913–14	.....	369	.....	10	.....	0	.....	0	.....	0	.....	.....
1914–15	.....	207	.....	15	.....	3	.....	0	.....	1	.....	1
1915–16	.....	401	.....	58	.....	15	.....	7	.....	0	.....	1
1916–17	.....	417	.....	71	.....	5	.....	1	.....	9	.....	1
Average	.....	348.50		38.50	.....	5.75	.....	2.00	.....	2.50	.....	1.00
Average seeds per fruit—												
1913–14	.....	3.62	.....	4	.....	3	.....	3	.....	2	.....	.....
1914–15	.....	4.12	.....	3	.....	4	.....	3	.....	1	.....	5
1915–16	.....	6.17	.....	9	.....	8	.....	6	.....	6	.....	5
Average	.....	4.71	.....	5.33	.....	5.22	.....	3.78	.....	2.89	.....	5.00
76. Lisbon strain:												
Green grade—												
1913–14	454– 0	1,689	23– 3	80	12–12	52	2–10	10	9–12	41	.....	.....
1914–15	465– 6	1,670	17–14	73	5–10	25	1– 7	6	12–15	50	18– 4	66
1915–16	234–14	846	45– 9	168	17–13	73	2– 4	9	4– 4	16	1– 1	4
1916–17	247– 6	921	7–15	35	3– 0	12	2– 6	9	4– 0	15	3–11	15
Average	350.41	1,281.50	23.64	89.00	9.80	40.50	2.17	8.50	7.73	30.50	7.67	28.33
Tree-Ripe grade—												
1913–14	56–10	264	1–10	7	1– 1	6	2–14	17	6–10	38	.....	.....
1914–15	166– 3	699	3– 0	15	0– 9	4	1– 3	6	1– 0	5	6– 1	42
1915–16	64–11	297	13–14	56	13–11	62	8–11	44	4–14	30	1–13	11
1916–17	83– 3	370	0–12	4	0– 8	3	0– 0	0	5– 0	22	2– 8	14
Average	92.67	407.50	4.81	20.50	3.95	18.75	3.19	16.75	4.38	23.75	3.46	22.33
Cull grade—												
1913–14	11– 8	81	0– 9	3	0– 7	2	0–10	5	3–12	30	.....	.....
1914–15	27–11	151	1– 3	8	3– 7	22	0– 4	2	0– 7	3	0– 2	1
1915–16	43– 0	230	12– 7	59	10–11	56	6– 5	38	0–15	9	0– 5	3
1916–17	62–13	441	1– 4	6	0– 0	0	0– 0	0	0– 0	0	1– 2	14
Average	36.25	225.75	3.86	19.00	3.64	20.00	1.80	11.25	1.28	10.50	0.52	6.00

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
.....	5	.....	4	.....	3	.....	8	.....	.....	.....	2	.....	4
.....	3	.....	3	.....	6	.....	6	.....	.....	.....	5	.....	11
.....	5	.....	5	.....	4	.....	4	.....	3	.....	9	.....	4
.....	4.33	.....	4.22	.....	4.56	.....	6.00	.....	3.00	.....	5.22	.....	6.44
12– 1	45	54– 3	209	187–15	679	93–12	352	.....	.....	63– 3	237	26–15	103
31–11	111	35– 6	133	60– 8	214	44– 6	161	.....	.....	118–11	414	52–15	189
3– 7	12	16– 8	62	11–14	45	18– 1	63	22–13	79	10– 9	37	16– 2	58
5– 5	20	2–13	11	20–14	77	41– 2	149	.....	.....	105– 0	394	0– 4	1
10.50	37.60	27.22	103.75	70.30	253.75	49.33	181.25	22.81	79.00	42.49	154.57	24.06	87.75
7–10	40	5– 4	21	8– 7	31	7– 1	29	.....	.....	14–12	63	4– 6	19
7–11	29	23– 9	95	15– 6	59	19– 8	77	.....	.....	43– 1	187	30– 5	134
2– 1	9	1– 2	7	1– 2	6	0– 0	0	2–5	9	9– 0	36	5– 0	22
0– 3	1	1– 0	5	7– 9	28	21–11	90	.....	.....	31– 8	145	0– 0	0
3.51	15.80	7.73	32.00	8.12	31.00	12.06	49.00	2.31	9.00	14.05	61.57	9.92	43.75
1– 6	8	0– 0	0	0–10	3	0–13	6	.....	.....	1– 8	13	0– 6	3
0– 4	1	1–13	9	3– 5	18	5–10	32	.....	.....	15–12	92	9– 3	51
0– 3	2	0– 8	4	5– 2	29	1– 0	6	1–12	11	2–12	15	1– 9	9
1– 0	8	2– 6	19	26– 4	204	9– 6	71	.....	.....	49– 0	283	25–13	217
0.56	3.80	1.17	8.00	8.83	63.50	4.20	28.75	1.75	11.00	9.87	57.57	9.23	70.00
21– 1	93	59– 7	230	197– 0	713	101–10	387	.....	.....	79– 7	313	31–11	125
39–10	141	60–12	237	79– 3	291	69– 8	270	.....	.....	177– 8	693	92– 7	374
5–11	23	18– 2	73	18– 2	80	19– 1	69	26–14	99	22– 5	88	22–11	89
6– 8	29	6– 3	35	54–11	309	72– 3	310	.....	.....	185– 8	822	26– 1	218
14.57	57.20	36.12	143.75	87.25	348.25	65.59	259.00	26.88	99.00	66.39	273.71	43.22	201.50
.....	1	.....	87	.....	126	.....	90	.....	.....	.....	38	.....	17
.....	10	.....	10	.....	13	.....	19	.....	.....	.....	99	.....	36
.....	9	.....	52	.....	43	.....	61	.....	54	.....	45	.....	56
.....	11	.....	7	.....	49	.....	138	.....	.....	.....	125	.....	0
.....	6.20	.....	39.00	.....	57.75	.....	77.00	.....	54.00	.....	43.86	.....	27.25
.....	2	.....	3	.....	5	.....	4	.....	.....	.....	4	.....	6
.....	2	.....	4	.....	4	.....	5	.....	.....	.....	8	.....	6
.....	7	.....	6	.....	6	.....	7	.....	6	.....	3	.....	5
.....	3.67	.....	4.63	.....	5.11	.....	5.25	.....	5.67	.....	5.11	.....	5.67
16– 7	63	61– 9	243	95– 7	344	137– 6	495	.....	.....	71– 5	269	23– 9	92
24– 8	89	46–13	177	41– 9	146	62– 2	226	.....	.....	136–11	465	97– 9	347
16– 5	50	31–11	116	22– 0	83	38– 0	128	26– 0	92	18– 3	66	11–12	41
16–14	67	12–12	50	51–15	190	63–10	226	.....	.....	80– 3	298	1– 0	4
14.83	53.80	38.20	146.50	52.73	190.75	75.28	268.75	26.00	92.00	43.77	156.86	33.47	121.00
7– 4	45	0– 8	2	14– 6	54	12– 0	48	.....	.....	9– 3	42	1– 2	5
10–12	41	21– 6	87	22–14	87	25–13	100	.....	.....	48–14	207	24–11	105
1–14	9	1– 6	9	1– 0	5	0– 0	0	2–10	10	7–10	31	7– 4	30
0– 8	2	2–12	11	15– 0	58	13–10	52	.....	.....	36– 0	164	6– 9	40
4.08	19.40	6.50	27.25	13.31	51.00	12.86	50.00	2.63	10.00	14.53	63.43	9.91	45.00
0– 4	3	0–12	5	1– 1	6	2– 3	13	.....	.....	1–12	13	0– 2	1
0– 2	1	2– 1	14	4– 2	21	4– 4	21	.....	.....	6–11	34	5– 0	24
0– 6	2	0–12	6	2– 8	15	2– 4	11	2–13	14	2– 2	10	1– 8	7
0–11	6	3– 2	25	20–10	138	7– 2	49	.....	.....	21– 0	128	7–14	75
0.29	2.40	1.67	12.50	7.08	45.00	3.95	23.50	2.81	14.00	4.51	26.43	3.63	26.75

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
76. Lisbon strain—Contd.												
Total crop—												
1913–14	522– 2	2,034	25– 6	90	14– 4	60	6– 2	32	20– 2	109	.....	.....
1914–15	659– 4	2,520	22– 1	96	9–10	51	2–14	14	14– 6	58	24– 7	109
1915–16	342– 9	1,373	71–14	283	42– 3	191	17– 4	91	10– 1	55	3– 3	18
1916–17	393– 6	1,732	9–15	45	3– 8	15	2– 6	9	9– 0	37	7– 5	43
Average	**479. 33**	**1,914. 75**	**32. 31**	**128. 50**	**17. 39**	**79. 25**	**7. 16**	**36. 50**	**13. 39**	**64. 75**	**11. 65**	**56. 67**
Variable fruits—												
1913–14	.....	302	.....	13	.....	0	.....	0	.....	1	.....	.....
1914–15	.....	227	.....	14	.....	5	.....	3	.....	9	.....	6
1915–16	.....	554	.....	41	.....	14	.....	1	.....	3	.....	0
1916–17	.....	467	.....	23	.....	7	.....	1	.....	8	.....	6
Average	.....	387. 50	.....	22. 75	.....	6. 50	.....	1. 25	.....	5. 25	.....	4. 00
Average seeds per fruit—												
1913–14	.....	3. 93	.....	1	.....	9	.....	2	.....	2	.....	.....
1914–15	.....	4. 22	.....	3	.....	3	.....	7	.....	3	.....	4
1915–16	.....	5. 44	.....	8	.....	6	.....	6	.....	7	.....	5
Average	.....	4. 58	.....	3. 89	.....	6. 00	.....	5. 00	.....	4. 00	.....	4. 50
81. Sporting strain:												
Green grade—												
1913–14	251–13	954	8–13	34	3– 2	13	1– 8	5	32–12	131	.....	.....
1914–15	571– 2	2,022	7– 1	28	2– 2	8	2– 0	8	76– 3	274	.....	(1)
1915–16	466–15	1,637	21– 6	75	9– 3	34	0– 9	2	4– 4	14	4–12	17
1916–17	294– 3	1,054	10–14	40	0– 0	0	1– 8	6	7– 3	24	30– 8	110
Average	396. 02	1,416. 75	12. 03	44. 25	3. 61	13. 75	1. 39	5. 25	30. 09	110. 75	17. 63	63. 50
Tree-Ripe grade—												
1913–14	23–12	106	1– 8	8	0–10	3	0–11	3	1–12	11	.....	.....
1914–15	75– 9	300	1– 6	8	2– 2	11	0– 7	3	0– 4	1	.....	(1)
1915–16	44–11	195	6– 6	27	3– 8	16	3– 0	15	2– 6	12	3– 3	15
1916–17	68–13	272	2–13	14	0– 0	0	0– 5	2	1– 0	4	0–11	3
Average	53. 20	218. 25	3. 02	14. 25	1. 56	7. 50	1. 11	5. 75	1. 34	7. 00	1. 94	9. 00
Cull grade—												
1913–14	3– 9	31	0– 7	3	0– 6	2	0– 7	5	0– 1	1	.....	.....
1914–15	11– 2	61	0– 2	1	1– 6	7	1– 0	7	0– 0	0	.....	(1)
1915–16	18–14	97	2– 0	10	0– 8	3	2–14	17	1– 2	7	0– 3	1
1916–17	19–10	122	1– 1	5	0– 0	0	1– 2	7	0– 5	2	0– 0	0
Average	13. 30	77. 75	0. 91	4. 75	0. 56	3. 00	1. 36	9. 00	0. 38	2. 50	0. 09	0. 50
Total crop—												
1913–14	279– 2	1,091	10–12	45	4– 2	18	2–10	13	34– 9	143	.....	.....
1914–15	657–13	2,383	8– 9	37	5–10	26	3– 7	18	76– 7	275	.....	(1)
1915–16	530– 8	1,929	29–12	112	13– 3	53	6– 7	34	7–12	33	8– 2	33
1916–17	382–10	1,448	14–12	59	0– 0	0	2–15	15	8– 8	30	31– 3	113
Average	**462. 52**	**1,712. 75**	**13. 95**	**63. 25**	**5. 73**	**24. 25**	**3. 86**	**20. 00**	**31. 81**	**120. 25**	**19. 65**	**73. 00**
Variable fruits—												
1913–14	.....	334	.....	5	.....	1	.....	0	.....	9	.....	.....
1914–15	.....	781	.....	11	.....	8	.....	4	.....	62	.....	(1)
1915–16	.....	1,225	.....	37	.....	9	.....	2	.....	6	.....	8
1916–17	.....	928	.....	32	.....	0	.....	1	.....	20	.....	66
Average	.....	817. 00	.....	21. 25	.....	4. 50	.....	1. 75	.....	24. 25	.....	37. 00
Average seeds per fruit—												
1913–14	.....	4. 65	.....	8	.....	7	.....	3	.....	3	.....	.....
1914–15	.....	2. 28	.....	3	.....	5	.....	0	.....	3	.....	(1)
1915–16	.....	2. 46	.....	1	.....	2	.....	2	.....	7	.....	4
Average	.....	3. 03	.....	3. 89	.....	4. 56	.....	1. 56	.....	4. 50	.....	3. 67

[1] Fruit picked in November, 1914, was removed without being recorded. In January and February,

trees of the Lisbon variety for the 6-year period from July 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
23–15	111	62–13	250	110–14	404	151– 9	556	.....	.....	82– 4	324	24–13	98
35– 6	131	70– 4	278	68– 9	254	92– 3	347	.....	.....	192– 4	706	127– 4	476
18– 9	61	33–13	131	25– 8	103	40– 4	139	31– 7	116	27–15	107	20– 8	78
18– 1	75	18–10	86	87– 9	386	84– 6	327	.....	.....	137– 3	590	15– 7	119
19. 19	**75. 60**	**46. 38**	**186. 25**	**73. 13**	**286. 75**	**92. 09**	**342. 25**	**31. 44**	**116. 00**	**62. 80**	**246. 71**	**47. 00**	**192. 75**
.....	1	.....	16	.....	67	.....	145	.....	.....	.....	37	.....	22
.....	11	.....	14	.....	21	.....	38	.....	.....	.....	49	.....	57
.....	41	.....	102	.....	71	.....	108	.....	66	.....	59	.....	48
.....	31	.....	23	.....	106	.....	149	.....	.....	.....	107	.....	6
.....	16. 80	.....	38. 75	.....	66. 25	.....	110. 00	.....	66. 00	.....	36. 00	.....	33. 25
.....	4	.....	3	.....	6	.....	2	.....	.....	.....	5	.....	5
.....	5	.....	3	.....	2	.....	6	.....	.....	.....	5	.....	6
.....	2	.....	2	.....	6	.....	6	.....	5	.....	6	.....	7
.....	3. 89	.....	2. 89	.....	4. 44	.....	4. 43	.....	4. 67	.....	5. 22	.....	6. 11
90–12	328	.....	(1)	.....	(1)	40– 4	159	34– 7	136	26– 9	98	13–10	50
54– 4	189	149– 8	529	49–15	177	101–12	363	65– 2	231	.....	.....	63– 3	215
15–12	57	100– 2	377	52– 0	196	69– 8	238	139– 6	456	24– 1	83	26– 0	88
72– 7	261	34– 2	125	61– 2	224	24–13	91	.....	.....	.....	.....	51–10	173
46. 64	**167. 00**	**94. 59**	**343. 67**	**54. 35**	**199. 00**	**59. 08**	**212. 75**	**79. 64**	**274. 33**	**25. 31**	**90. 50**	**22. 06**	**75. 14**
0– 2	1	.....	(1)	.....	(1)	5– 7	22	3–13	16	8– 8	36	1– 5	6
2–13	10	13–14	54	13– 0	47	13– 6	49	20–11	87	.....	.....	7–10	30
1–14	10	1–13	8	0–13	5	0– 0	0	2–11	10	6–15	26	12– 2	51
0– 0	0	4–13	20	1– 6	5	5–12	22	.....	.....	.....	.....	52– 1	202
0. 96	**4. 20**	**6. 83**	**27. 33**	**5. 06**	**19. 00**	**6. 14**	**23. 25**	**9. 06**	**37. 67**	**7. 72**	**31. 00**	**10. 45**	**41. 29**
0– 3	1	.....	(1)	.....	(1)	1– 9	15	0– 7	3	0– 0	0	0– 1	1
0–14	5	1– 0	5	2– 2	9	1– 3	5	2– 4	16	.....	.....	1– 3	6
0– 3	1	0– 6	2	3– 7	16	1– 1	6	2– 9	12	4– 3	20	0– 6	2
0– 0	0	1– 2	9	6– 6	37	2–10	18	.....	.....	.....	.....	7– 0	44
0. 25	**1. 40**	**0. 83**	**5. 33**	**3. 98**	**20. 67**	**1. 61**	**11. 00**	**1. 75**	**10. 33**	**2. 09**	**10. 00**	**1. 23**	**7. 57**
91– 1	330	.....	(1)	.....	(1)	47– 4	196	38–11	155	35– 1	134	15– 0	57
57–15	204	164– 6	588	65– 1	233	116– 5	417	88– 1	334	.....	.....	72– 0	251
17–13	68	102– 5	387	56– 4	217	70– 9	244	144–10	478	35– 3	129	38– 8	141
72– 7	261	40– 1	154	68–14	266	33– 3	131	.....	.....	.....	.....	110–11	419
47. 85	**172. 60**	**102. 25**	**376. 33**	**63. 39**	**238. 67**	**66. 83**	**247. 00**	**90. 46**	**322. 33**	**35. 13**	**131. 50**	**33. 74**	**124. 00**
.....	121	.....	(1)	.....	(1)	.....	84	.....	60	.....	38	.....	16
.....	108	.....	181	.....	74	.....	134	.....	107	.....	.....	.....	92
.....	35	.....	301	.....	162	.....	201	.....	332	.....	63	.....	69
.....	232	.....	105	.....	191	.....	101	.....	.....	.....	.....	.....	180
.....	99. 20	.....	195. 67	.....	142. 33	.....	130. 00	.....	166. 33	.....	50. 50	.....	51. 00
.....	8	.....	(1)	.....	(1)	.....	1	.....	6	.....	2	.....	3
.....	1	.....	4	.....	6	.....	0	.....	0	.....	.....	.....	1
.....	1	.....	2	.....	3	.....	4	.....	2	.....	1	.....	2
.....	3. 33	.....	2. 83	.....	4. 50	.....	1. 37	.....	2. 67	.....	1. 40	.....	2. 22

1914, this tree was picked by mistake by the regular pickers and no record made of its crop.

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
85. Open strain:												
Green grade—												
1913–14	446–3	1,646	18–9	63	16–6	62	2–4	9	4–14	18	.....	.....
1914–15	436–2	1,610	8–4	34	4–6	18	2–5	10	8–4	32	28–15	106
1915–16	243–13	907	30–2	112	15–11	64	1–7	6	1–13	7	0–12	3
1916–17	126–2	494	16–2	68	1–12	7	1–0	4	0–0	0	1–5	5
Average	313.06	1,164.25	18.26	69.25	9.55	37.75	1.75	7.25	3.73	14.25	10.33	38.00
Tree-Ripe grade—												
1913–14	49–4	214	0–3	1	1–4	5	1–4	7	4–8	21	.....	.....
1914–15	171–12	728	9–5	45	1–8	9	2–2	12	1–0	5	0–14	5
1915–16	83–10	399	15–13	65	12–2	58	11–1	59	7–8	47	2–3	15
1916–17	93–15	450	13–8	63	0–14	5	0–3	1	4–0	17	1–3	7
Average	99.64	447.75	9.70	43.50	3.94	19.25	3.66	19.75	4.25	22.50	1.42	9.00
Cull grade—												
1913–14	14–8	93	0–7	4	0–4	2	0–12	5	6–13	41	.....	.....
1914–15	22–10	137	1–3	7	2–3	13	1–3	8	0–0	0	0–3	1
1915–16	50–10	299	13–5	73	11–5	62	11–9	74	1–2	9	0–8	4
1916–17	92–9	745	2–10	15	0–14	5	0–0	0	0–0	0	0–5	5
Average	45.08	318.50	4.39	24.75	3.66	20.50	3.38	21.75	1.98	12.50	0.33	3.33
Total crop—												
1913–14	509–15	1,953	19–3	68	17–14	69	4–4	21	16–3	80	.....	.....
1914–15	630–8	2,475	18–12	86	8–1	40	5–10	30	9–4	37	30–0	112
1915–16	378–1	1,605	59–4	250	39–2	184	24–1	139	10–7	63	3–7	22
1916–17	312–10	1,689	32–4	146	3–8	17	1–3	5	4–0	17	2–13	17
Average	457.78	1,930.50	32.36	137.50	17.14	77.50	8.78	48.75	9.97	49.25	12.08	50.33
Variable fruits—												
1913–14	.....	554	.....	13	.....	4	.....	0	.....	0	.....	.....
1914–15	.....	427	.....	17	.....	5	.....	0	.....	5	.....	21
1915–16	.....	671	.....	26	.....	16	.....	3	.....	0	.....	1
1916–17	.....	325	.....	76	.....	3	.....	1	.....	3	.....	3
Average	.....	494.25	.....	33.00	.....	7.00	.....	1.00	.....	2.00	.....	8.33
Average seeds per fruit—												
1913–14	.....	4.47	.....	3	.....	5	.....	3	.....	2	.....	.....
1914–15	.....	4.69	.....	5	.....	5	.....	2	.....	0	.....	5
1915–16	.....	5.03	.....	8	.....	8	.....	6	.....	3	.....	8
Average	.....	4.74	.....	5.56	.....	6.22	.....	3.56	.....	1.87	.....	6.50
93. Open strain:												
Green grade—												
1913–14	417–4	1,570	16–14	60	13–3	55	2–8	10	5–4	21	.....	.....
1914–15	229–11	838	8–4	34	5–4	22	1–10	7	2–6	9	1–7	5
1915–16	172–2	638	46–14	179	22–2	91	1–0	4	0–0	0	0–0	0
1916–17	203–10	757	13–12	55	2–13	11	7–6	29	2–11	10	3–10	14
Average	255.67	950.75	21.44	82.00	10.84	44.75	3.12	12.50	2.58	10.00	1.69	6.33
Tree-Ripe grade—												
1913–14	152–1	634	0–4	1	1–0	6	1–15	12	5–9	34	.....	.....
1914–15	178–9	797	4–12	24	4–11	26	5–9	32	0–0	0	0–4	1
1915–16	98–11	483	25–14	123	24–13	112	15–2	89	3–12	26	1–1	7
1916–17	89–9	404	7–10	38	2–0	13	0–9	3	11–2	48	5–14	28
Average	129.72	579.50	9.62	46.50	8.16	39.25	5.80	34.00	5.11	27.00	2.39	12.00
Cull grade—												
1913–14	27–8	187	0–4	2	0–9	4	0–12	9	9–10	70	.....	.....
1914–15	43–4	322	3–1	19	2–15	19	1–1	10	0–11	6	0–5	2
1915–16	68–15	431	22–7	131	14–0	84	14–7	103	0–9	5	1–0	7
1916–17	67–1	448	0–12	4	1–3	8	1–2	7	1–0	5	0–4	2
Average	51.68	347.00	6.62	39.00	4.67	28.75	4.34	32.25	2.97	21.50	0.52	3.67
Total crop—												
1913–14	596–13	2,391	17–6	63	14–12	65	5–3	31	20–7	125	.....	.....
1914–15	451–8	1,957	16–1	77	12–14	67	8–4	49	3–1	15	2–0	8
1915–16	339–12	1,552	95–3	433	61–1	287	30–9	196	4–5	31	2–1	14
1916–17	360–4	1,609	22–2	97	6–0	32	9–1	39	14–13	63	9–12	44
Average	437.08	1,877.25	37.69	167.50	23.67	112.75	13.27	78.75	10.66	58.50	4.60	22.00

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
16– 8	63	60– 9	237	169– 9	599	91– 1	341	.....	.....	46– 8	177	19–15	77
31– 6	118	50– 4	195	60–11	220	62– 6	232	.....	.....	120– 6	430	58–15	215
3– 0	10	27– 2	104	35– 7	138	34– 5	128	56–12	199	19– 2	70	18– 4	66
3– 1	12	1– 8	6	9– 3	35	20– 7	77	.....	.....	71–12	280	0– 0	0
10.79	40.60	34.86	135.50	68.72	248.00	52.05	194.50	56.75	199.00	36.82	136.71	24.28	89.50
6–10	34	5–10	23	3–13	14	9–10	40	.....	.....	10– 0	42	6– 6	27
7–15	31	23– 5	97	13–12	54	40– 3	159	.....	.....	56– 6	245	15– 6	66
2– 0	9	4– 5	27	1–15	10	0– 0	0	8–13	35	7–10	31	10– 4	43
1– 4	7	1–12	10	4– 9	18	9–15	45	.....	.....	56–11	277	0– 0	0
3.56	16.20	8.75	39.25	6.02	24.00	14.94	61.00	8.81	35.00	18.67	85.00	8.00	34.00
0–12	6	0– 3	1	2– 3	15	0– 9	4	.....	.....	2– 2	12	0– 7	3
1– 2	6	0–12	5	3– 6	21	2– 0	11	.....	.....	6– 2	38	4– 8	27
0– 0	0	0– 8	3	3– 9	22	0– 4	6	1–14	10	3–15	21	2–11	15
0–10	7	2– 6	22	13–10	115	3– 2	28	.....	.....	29– 8	189	39– 8	359
0.50	3.80	0.95	7.75	5.69	43.25	1.48	12.25	1.88	10.00	5.96	37.14	11.78	101.00
23–14	103	66– 6	261	175– 9	628	101– 4	385	.....	.....	58–10	231	26–12	107
40– 7	155	74– 5	297	77–13	295	104– 9	402	.....	.....	182–14	713	78–13	308
5– 0	19	31–15	134	40–15	170	34– 9	134	67–7	244	30–11	122	31– 3	124
4–15	26	5–10	38	27– 6	168	33– 8	150	.....	.....	157–15	746	39– 8	359
14.85	**60.60**	**44.56**	**182.50**	**80.42**	**315.25**	**68.47**	**267.75**	**67.44**	**244.00**	**61.45**	**258.86**	**44 06**	**224.50**
.....	22	.....	116	.....	168	.....	130	.....	.....	.....	76	.....	25
.....	22	.....	50	.....	35	.....	69	.....	.....	.....	159	.....	44
.....	9	.....	92	.....	122	.....	108	.....	178	.....	55	.....	61
.....	9	.....	4	.....	29	.....	95	.....	.....	.....	102	.....	0
.....	12.40	.....	65.50	.....	88.50	.....	100.50	.....	178.00	.....	56.00	.....	32.50
.....	6	.....	6	.....	7	.....	4	.....	.....	.....	2	.....	7
.....	5	.....	4	.....	4	.....	6	.....	.....	.....	9	.....	4
.....	7	.....	6	.....	2	.....	1	.....	5	.....	3	.....	1
.....	6.00	.....	5.44	.....	4.44	.....	4.00	.....	5.33	.....	4.67	.....	4.00
12– 8	49	55– 4	218	126–12	456	69– 3	264	.....	.....	95– 1	355	20–11	82
5–12	20	22–12	84	22– 2	79	34– 2	123	68– 4	242	.....	.....	57–12	213
1– 7	5	9– 6	35	13– 2	49	27– 9	95	25– 6	90	16– 6	58	8–14	32
10– 5	40	9– 4	35	31– 1	112	42– 2	152	.....	.....	77– 0	284	3–10	15
6.00	22.80	24.16	93.00	48.27	174.00	43.25	158.50	46.82	166.00	37.69	139.40	18.19	68.40
0– 8	2	11–10	49	61– 7	233	16–11	70	.....	.....	40– 0	173	13– 1	54
2– 3	8	7– 7	29	13– 0	50	20– 3	80	77– 5	349	.....	.....	43– 3	198
2– 2	9	3– 7	20	0– 8	3	0– 0	0	1– 0	4	16– 8	70	4– 6	20
1– 3	6	3– 0	13	6– 4	24	10– 0	40	.....	.....	37– 7	161	4– 8	30
1.20	5.00	6.38	27.75	20.30	77.50	11.72	47.50	39.16	176.50	18.79	80.80	13.03	60.40
0–10	6	1– 9	8	5– 2	35	3–12	24	.....	.....	4– 7	24	0–13	5
0– 0	0	1– 2	8	5– 0	33	3–12	22	12– 9	128	.....	.....	12–12	75
0–13	7	1– 6	10	5– 1	31	1– 1	5	4– 6	26	2– 8	14	1– 5	8
0– 9	6	2– 0	17	12–14	88	5–11	42	.....	.....	25–10	142	16– 0	127
0.40	3.80	1.51	10.75	7.02	46.75	3.56	23.25	8.47	77.00	6.51	36.00	6.18	43.00
13–10	57	68– 7	275	193– 5	724	89–10	358	.....	.....	139–8	552	34– 9	141
7–15	28	31– 5	121	40– 2	162	58– 1	225	158– 2	719	.....	.....	113–11	486
4– 6	21	14– 3	65	18–11	83	28–10	100	30–12	120	35–6	142	14– 9	60
12– 1	52	14– 4	65	50– 3	224	57–13	234	.....	.....	140–1	587	24– 2	172
7.60	**31.60**	**32.05**	**131.50**	**75.58**	**298.25**	**58.53**	**229.25**	**94.44**	**419.50**	**62.99**	**256.20**	**37.39**	**171.80**

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
93. Open strain—Contd.												
Variable fruits—												
1913–14	.....	290	.....	16	.....	0	.....	0	.....	0	.....	.....
1914–15	.....	302	.....	13	.....	12	.....	3	.....	0	.....	1
1915–16	.....	467	.....	55	.....	59	.....	3	.....	0	.....	0
1916–17	.....	356	.....	41	.....	3	.....	10	.....	8	.....	7
Average	.....	353.75	.....	31.25	.....	18.50	.....	4.00	.....	2.00	.....	2.67
Average seeds per fruit—												
1913–14	.....	3.33	.....	2	.....	3	.....	1	.....	3	.....	.....
1914–15	.....	5.87	.....	7	.....	3	.....	3	.....	3	.....	3
1915–16	.....	5.97	.....	8	.....	9	.....	6	.....	5	.....	7
Average	.....	5.09	.....	5.67	.....	4.89	.....	3.44	.....	3.43	.....	4.60
101. Open strain:												
Green grade—												
1913–14	228–12	862	10– 6	40	4–14	21	0– 8	2	3– 2	14	.....	.....
1914–15	148– 5	569	6– 4	26	6– 0	25	4–13	20	3– 4	13	8–14	34
1915–16	152–11	568	26–11	103	7– 8	30	1– 8	6	0– 0	0	0–13	3
1916–17	162– 2	624	18– 0	77	0–11	3	1– 1	4	0– 0	0	1–14	7
Average	172.97	655.75	15.33	61.50	4.77	19.75	1.97	8.00	1.59	6.75	3.85	14.67
Tree-Ripe grade—												
1913–14	101–10	436	5– 5	24	0– 2	1	0–12	6	2–14	21	.....	.....
1914–15	328– 5	1,503	4–15	25	3– 5	20	15– 7	92	3– 6	19	0– 5	2
1915–16	143– 2	713	21– 9	96	2– 6	12	19– 3	97	12–12	91	3–13	25
1916–17	86– 6	415	21– 4	114	0– 7	3	0– 0	0	5–10	25	2– 0	9
Average	164.86	766.75	13.27	64.75	1.56	9.00	8.84	48.75	6.16	39.00	2.04	12.00
Cull grade—												
1913–14	12– 4	77	1– 0	7	0– 8	3	0– 2	1	1– 9	12	.....	.....
1914–15	59–10	382	2– 3	14	4– 6	30	4–12	36	1– 4	9	1– 7	8
1915–16	94–15	608	19–10	128	12–11	76	23–15	156	1–11	14	2–13	22
1916–17	76– 0	499	3– 1	17	0–11	5	0– 0	0	0– 9	4	1– 7	12
Average	60.70	391.50	6.47	41.50	4.56	28.50	7.20	48.25	1.27	9.75	1.90	14.00
Total crop—												
1913–14	342–10	1,375	16–11	71	5– 8	25	1– 6	9	7– 9	47	.....	.....
1914–15	536– 4	2,454	13– 6	65	13–11	75	25– 0	148	7–14	41	10–10	44
1915–16	390–12	1,889	67–14	327	22– 9	118	44–10	259	14– 7	105	7– 7	50
1916–17	324– 8	1,538	42– 5	208	1–13	11	1– 1	4	6– 3	29	5– 5	28
Average	398.53	1,814.00	35.07	167.75	10.89	57.25	18.02	105.00	9.02	55.50	7.79	40.67
Variable fruits—												
1913–14	.....	131	.....	1	.....	0	.....	0	.....	0	.....	.....
1914–15	.....	84	.....	5	.....	2	.....	0	.....	0	.....	0
1915–16	.....	292	.....	7	.....	8	.....	2	.....	0	.....	0
1916–17	.....	192	.....	61	.....	0	.....	0	.....	1	.....	0
Average	.....	174.75	.....	18.50	.....	2.50	.....	0.50	.....	0.25	.....	0
Average seeds per fruit—												
1913–14	.....	5.41	.....	3	.....	4	.....	4	.....	3	.....	.....
1914–15	.....	6.79	.....	4	.....	4	.....	7	.....	6	.....	5
1915–16	.....	8.09	.....	7	.....	10	.....	10	.....	5	.....	7
Average	.....	6.82	.....	4.78	.....	5.89	.....	6.89	.....	4.75	.....	6.00
113. Open strain:												
Green grade—												
1913–14	190– 5	746	16–14	63	4– 7	19	0– 0	0	3– 4	14	.....	.....
1914–15	155–10	589	8–15	39	2–12	11	6– 3	27	3– 8	14	3– 5	13
1915–16	109– 1	405	9–14	38	25– 6	100	2– 0	8	1– 5	5	1– 4	5
1916–17	162–14	634	22–12	102	1– 0	4	2– 8	9	1–13	7	1–12	7
Average	154.47	593.50	14.61	60.50	8.39	33.50	2.67	11.00	2.47	10.00	2.10	8.33

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
.....	3	.....	25	.....	84	.....	68	.....	.....	.....	76	.....	18
.....	8	.....	18	.....	17	.....	35	.....	84	.....	.....	.....	111
.....	5	.....	27	.....	42	.....	86	.....	72	.....	80	.....	38
.....	15	.....	17	.....	57	.....	112	.....	.....	.....	82	.....	4
.....	6.20	.....	21.75	.....	50.00	.....	75.25	.....	78.00	.....	47.60	.....	34.20
.....	3	.....	5	.....	3	.....	4	.....	.....	.....	6	.....	4
.....	10	.....	9	.....	8	.....	4	.....	8	.....	.....	.....	9
.....	4	.....	6	.....	6	.....	5	.....	7	.....	3	.....	4
.....	5.25	.....	6.56	.....	5.33	.....	4.38	.....	7.33	.....	4.50	.....	5.67
6–0	22	45–6	176	84–8	307	44–0	169	.....	.....	22–7	81	7–9	30
9–4	36	14–9	58	9–14	37	27–9	105	28–0	104	.....	.....	29–14	111
0–0	0	4–6	16	10–10	41	10–1	36	36–14	128	28–9	107	25–11	98
9–13	40	3–3	13	20–12	80	41–15	155	.....	.....	63–13	240	1–0	5
5.01	19.60	16.88	65.75	31.44	116.25	30.89	116.25	32.44	116.00	22.96	85.60	12.83	48.80
0–0	0	1–13	8	43–3	166	23–3	99	.....	.....	21–6	98	3–0	13
9–14	39	40–6	172	22–2	90	31–8	128	159–9	744	.....	.....	37–8	172
4–8	20	10–14	65	1–4	7	0–0	0	3–2	13	48–12	215	14–15	72
3–2	15	0–4	1	6–12	27	6–8	25	.....	.....	40–7	196	0–0	0
3.50	14.80	13.33	61.50	18.33	72.50	15.30	63.00	81.34	378.50	22.11	101.80	11.09	51.40
0–4	2	0–5	2	1–10	10	4–6	25	.....	.....	1–4	8	1–4	7
0–14	5	2–0	13	2–4	13	5–0	31	28–13	177	.....	.....	6–11	46
0–10	6	1–15	15	3–15	30	3–12	25	4–5	24	11–14	67	7–12	45
0–7	3	3–2	26	7–12	53	9–6	55	.....	.....	34–0	205	15–9	119
0.44	3.20	1.84	14.00	3.89	26.50	5.63	34.00	16.56	100.50	9.43	56.00	6.25	43.40
6–4	24	47–8	186	129–5	483	71–9	293	.....	.....	45–1	187	11–13	50
20–0	80	56–15	243	34–4	140	64–1	264	216–6	1,025	.....	.....	74–1	329
5–2	26	17–3	96	15–13	78	13–13	61	44–5	165	89–3	389	48–6	215
13–6	58	6–9	40	35–4	160	57–13	235	.....	.....	138–4	641	16–9	124
8.95	**37.60**	**32.05**	**141.25**	**53.66**	**215.25**	**51.81**	**213.25**	**130.34**	**595.00**	**54.50**	**243.40**	**30.16**	**143.60**
.....	1	.....	4	.....	74	.....	34	.....	.....	.....	14	.....	3
.....	0	.....	11	.....	6	.....	9	.....	37	.....	.....	.....	14
.....	0	.....	9	.....	30	.....	26	.....	45	.....	91	.....	74
.....	10	.....	3	.....	23	.....	49	.....	.....	.....	45	.....	0
.....	2.20	.....	6.75	.....	33.25	.....	29.50	.....	41.00	.....	30.00	.....	18.20
.....	5	.....	9	.....	5	.....	7	.....	.....	.....	7	.....	8
.....	11	.....	9	.....	8	.....	6	.....	8	.....	.....	.....	7
.....	9	.....	8	.....	7	.....	11	.....	7	.....	4	.....	11
.....	8.71	.....	8.56	.....	6.56	.....	7.50	.....	7.83	.....	5.67	.....	8.67
3–6	15	43–1	168	59–11	232	26–4	106	.....	.....	24–15	96	8–7	33
4–4	16	19–7	76	8–12	33	18–10	69	34–14	127	.....	.....	45–0	164
0–4	1	0–9	2	3–13	15	12–13	46	20–14	71	14–4	51	16–11	63
3–8	14	4–3	16	16–12	64	41–4	152	.....	.....	66–4	255	1–2	4
2.28	9.20	16.81	65.50	22.25	86.00	24.73	93.25	27.88	99.00	21.09	80.40	14.25	52.80

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
113. Open strain—Contd.												
Tree-Ripe grade—												
1913–14	88–12	395	5– 8	25	0–13	5	0–14	6	5– 9	35	.....	.....
1914–15	218– 1	964	4– 1	21	2– 0	11	5– 5	28	2– 7	13	0– 6	2
1915–16	130– 3	656	11– 1	49	57– 6	274	14– 1	82	8– 8	55	3– 0	18
1916–17	90– 8	440	17– 6	105	0–15	5	0– 7	3	6– 5	29	0–12	3
Average	131.87	613.75	9.50	50.00	15.28	73.75	5.17	29.75	5.70	33.00	1.38	7.67
Cull grade—												
1913–14	13– 6	103	0–14	7	0–14	7	1– 2	11	3– 1	32	.....	.....
1914–15	60– 9	378	7– 6	44	3– 0	19	1–11	10	1– 3	9	0– 8	3
1915–16	64–13	404	13–14	79	17– 8	99	9– 2	65	1– 8	12	2– 8	20
1916–17	63– 0	410	7– 5	46	0– 9	4	0–10	4	0– 5	2	0– 8	5
Average	50.44	323.75	7.36	44.00	5.48	32.25	3.14	22.50	1.52	13.75	1.17	9.33
Total crop—												
1913–14	292– 7	1,244	23– 4	95	6– 2	31	2– 0	17	11–14	81	.....	.....
1914–15	434– 4	1,931	20– 6	104	7–12	41	13– 3	65	7– 2	36	4– 3	18
1915–16	304– 1	1,465	34–13	166	100–4	473	25– 3	155	11– 5	72	6–12	43
1916–17	316– 6	1,484	47– 7	253	2– 8	13	3– 9	16	8– 7	38	3– 0	15
Average	336.78	1,531.00	31.48	154.50	29.16	139.50	10.98	63.25	9.69	56.75	4.65	25.33
Variable fruits—												
1913–14	.....	112	.....	3	.....	0	.....	0	.....	0	.....	.....
1914–15	.....	120	.....	6	.....	4	.....	6	.....	0	.....	0
1915–16	.....	256	.....	15	.....	40	.....	6	.....	2	.....	0
1916–17	.....	203	.....	79	.....	3	.....	4	.....	0	.....	3
Average	.....	172.75	.....	25.75	.....	11.75	.....	4.00	.....	0.50	.....	1.00
Average seeds per fruit—												
1913–14	.....	5.59	.....	7	.....	4	.....	4	.....	4	.....	.....
1914–15	.....	7.50	.....	6	.....	3	.....	5	.....	2	.....	8
1915–16	.....	6.82	.....	8	.....	8	.....	6	.....	5	.....	0
Average	.....	6.67	.....	7.00	.....	5.11	.....	5.13	.....	3.78	.....	7.17
114. Dense-Unproductive strain:												
Green grade—												
1913–14	158– 1	579	7– 7	28	0–12	3	0– 9	2	1–15	7	.....	.....
1914–15	301– 0	1,060	1–12	6	0– 0	0	3–15	16	80–13	287	47– 6	161
1915–16	327– 5	1,190	8– 7	28	1– 1	4	1– 5	5	9–14	35	31–12	112
1916–17	251–10	932	10–14	45	1– 5	5	1–14	7	4– 5	15	20– 8	75
Average	259.75	940.25	7.13	26.75	0.78	3.00	1.92	7.50	24.23	86.00	33.21	116.00
Tree-Ripe grade—												
1913–14	3– 6	14	0–10	3	0– 4	1	0– 0	0	0–12	3	.....	.....
1914–15	7– 4	29	0–12	3	0– 0	0	0– 0	0	0– 0	0	0– 0	0
1915–16	0– 5	38	0–14	4	0– 0	0	2– 0	10	0– 9	2	0– 0	0
1916–17	24– 9	101	0–14	6	0– 3	1	0– 0	0	2–15	13	0– 5	2
Average	10.87	45.50	0.78	4.00	0.11	0.50	0.50	2.50	1.06	4.50	0.10	0.67
Cull grade—												
1913–14	2– 6	15	0– 8	4	0– 2	1	0– 0	0	0– 0	0	.....	.....
1914–15	4– 2	23	0– 4	1	0– 0	0	0– 0	0	0– 9	2	0– 9	2
1915–16	12– 4	67	0– 2	1	1– 3	6	1– 6	9	0– 0	0	0– 2	1
1916–17	26– 0	153	0– 0	0	0– 0	0	1– 6	14	0– 2	1	0–11	5
Average	11.19	64.50	0.22	1.50	0.32	1.75	0.69	5.75	0.17	0.75	0.46	2.67
Total crop—												
1913–14	163–13	608	8– 9	35	1– 2	5	0– 9	2	2–11	10	.....	.....
1914–15	312– 6	1,112	2–12	10	0– 0	0	3–15	16	81– 6	289	47–15	163
1915–16	347–14	1,295	9– 7	33	2– 4	10	4–11	24	10– 7	37	31–14	113
1916–17	303– 3	1,186	11–12	51	1– 8	6	3– 4	21	7– 6	29	21– 8	82
Average	281.81	1,050.25	8.13	32.25	1.22	5.25	3.11	15.75	25.47	91.25	33.77	119.33

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
0- 4	1	1-13	8	29- 2	118	14-10	63	.....	.....	24- 9	111	5-10	23
1- 4	5	18- 6	76	15- 1	60	19-10	81	102- 9	456	.....	.....	47- 0	211
5- 6	26	9- 5	54	0- 0	0	0- 0	0	3-14	16	10-11	48	6-15	34
2-10	13	1-15	9	3- 7	14	17- 0	70	.....	.....	37- 7	175	2- 4	14
1.90	9.00	7.86	36.75	11.91	48.00	12.81	53.50	53.22	236.00	14.54	66.80	12.36	56.40
0- 2	2	0- 7	2	1- 7	8	3- 7	20	.....	.....	1- 6	10	0-10	4
0- 0	0	1- 4	9	2- 8	15	7- 2	42	24-13	156	.....	.....	11- 2	71
3- 8	30	2- 1	13	1- 9	11	1- 1	7	3-12	22	2-14	17	5- 8	29
0- 8	4	1-11	13	7- 8	51	6- 6	49	.....	.....	28-14	161	8-12	71
0.83	7.20	1.36	9.25	3.25	21.25	4.50	29.50	14.28	89.00	6.63	37.60	5.20	35.00
3-12	18	45- 5	178	90- 4	358	44- 5	189	.....	.....	50-14	217	14-11	60
5- 8	21	39- 1	161	26- 5	108	45- 6	192	162- 4	739	.....	.....	103- 2	446
9- 2	57	11-15	69	5- 6	26	13-14	53	28- 8	109	27-13	116	29- 2	126
6-10	31	7-13	38	27-11	129	64-10	271	.....	.....	132- 9	591	12- 2	89
5.00	25.40	26.03	111.50	37.41	155.25	42.05	176.25	95.38	424.00	42.25	184.80	31.81	144.20
.....	0	.....	17	.....	44	.....	27	.....	.....	.....	16	.....	5
.....	1	.....	10	.....	8	.....	17	.....	38	.....	.....	.....	30
.....	0	.....	0	.....	11	.....	34	.....	41	.....	46	.....	61
.....	6	.....	7	.....	17	.....	47	.....	.....	.....	37	.....	0
.....	1.40	.....	8.50	.....	20.00	.....	31.25	.....	39.50	.....	19.80	.....	19.20
.....	7	.....	5	.....	3	.....	9	.....	.....	.....	4	.....	7
.....	10	.....	9	.....	11	.....	12	.....	10	.....	.....	.....	7
.....	6	.....	8	.....	7	.....	9	.....	9	.....	6	.....	5
.....	7.50	.....	7.22	.....	7.13	.....	10.13	.....	9.33	.....	5.50	.....	6.11
31-11	112	48- 2	182	50-14	184	11- 8	42	.....	.....	4-10	17	0- 9	2
41-12	147	44-13	166	26- 0	91	20-12	74	.....	.....	26- 2	86	7-11	26
59- 1	211	71-13	270	60- 5	234	18- 7	65	39-12	137	17- 9	62	7-15	27
37- 6	138	19- 5	74	57-10	210	30-11	110	.....	.....	68- 0	250	0-12	3
33.98	121.60	46.01	173.00	48.70	179.75	20.34	72.75	39.75	137.00	16.62	59.29	4.23	14.50
0- 3	1	0- 0	0	0- 0	0	0- 5	1	.....	.....	1- 0	4	0- 4	1
0- 0	0	0- 8	2	1- 0	4	1- 8	6	.....	.....	1-12	7	1-12	7
0- 0	0	0- 3	1	0- 0	0	0- 5	2	0- 8	2	1-11	7	2- 3	10
0- 0	0	1- 9	7	1-12	6	7- 7	28	.....	.....	9- 8	38	0- 0	0
0.04	0.20	0.56	2.50	0.69	2.50	2.39	9.25	0.50	2.00	1.99	8.00	1.05	4.50
0- 4	2	0- 5	1	1- 0	6	0- 0	0	.....	.....	0- 3	1	0- 0	0
0-11	4	0- 8	3	0- 3	1	0- 0	0	.....	.....	0-10	5	0-12	5
0-10	6	1- 0	6	5-11	27	0- 3	1	0-10	3	0- 9	3	0-12	4
0- 6	3	0- 4	2	3- 9	22	0- 8	4	.....	.....	9- 6	46	9-12	56
0.39	3.00	0.52	3.00	2.61	14.00	0.17	1.25	0.63	3.00	1.54	7.86	2.81	16.25
32- 2	115	48- 7	183	51-14	190	11-13	43	.....	.....	5-13	22	0-13	3
42- 7	151	45-13	171	27- 3	96	22- 4	80	.....	.....	28- 8	98	10- 3	38
59-11	217	73- 0	277	66- 0	261	18-15	68	40-14	142	19-13	72	10-14	41
37-12	141	21- 2	83	62-15	238	38-10	142	.....	.....	86-14	334	10- 8	59
34.40	124.80	47.09	178.50	52.00	196.25	22.91	83.25	40.88	142.00	20.14	75.14	8.09	35.25

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
114. Dense-Unproductive strain—Continued.												
Variable fruits—												
1913–14	.....	510	.....	25	.....	4	.....	2	.....	7	.....	.....
1914–15	.....	707	.....	0	.....	.....	.....	1	.....	61	.....	83
1915–16	.....	876	.....	15	.....	4	.....	2	.....	18	.....	42
1916–17	.....	863	.....	36	.....	4	.....	3	.....	13	.....	45
Average	.....	739.00	.....	19.00	.....	3.00	.....	2.00	.....	24.75	.....	56.67
Average seeds per fruit—												
1913–14	.....	2.61	.....	4	.....	4	.....	3	.....	4	.....	.....
1914–15	.....	.33	.....	0	.....	.....	.....	0	.....	0	.....	0
1915–16	.....	1.29	.....	1	.....	1	.....	1	.....	0	.....	2
Average	.....	1.38	.....	1.78	.....	2.80	.....	1.80	.....	1.50	.....	0.75
117. Dense-Unproductive strain:												
Green grade—												
1913–14	183–5	697	10–9	42	0–11	3	0–0	0	0–0	0	.....	.....
1914–15	168–14	607	2–6	10	0–0	0	1–2	5	41–0	150	18–0	66
1915–16	267–7	977	2–3	8	0–0	0	2–7	8	12–13	46	21–2	77
1916–17	167–8	626	8–13	41	0–0	0	0–9	2	5–12	22	11–9	43
Average	196.78	726.75	5.98	25.25	0.17	0.75	1.03	3.75	14.89	54.50	16.90	62.00
Tree-Ripe grade—												
1913–14	4–1	19	1–8	7	0–6	2	0–6	2	0–4	1	.....	.....
1914–15	7–3	31	4–0	17	0–0	0	0–3	1	0–0	0	0–0	0
1915–16	3–15	17	0–7	2	0–0	0	0–7	2	0–13	3	0–3	1
1916–17	16–1	69	2–1	13	0–0	0	0–0	0	0–0	0	0–8	2
Average	7.81	34.00	2.00	9.75	0.09	0.50	0.25	1.25	0.27	1.00	0.23	1.00
Cull grade—												
1913–14	2–13	16	0–7	4	0–0	0	0–0	0	0–1	1	.....	.....
1914–15	1–10	8	0–11	3	0–0	0	0–0	0	0–0	0	0–0	0
1915–16	14–0	70	0–5	2	0–0	0	0–6	3	0–0	0	1–2	7
1916–17	33–8	199	1–8	7	0–0	0	1–5	15	0–0	0	0–2	1
Average	12.98	73.25	0.73	4.00	0	0	0.42	4.50	0.02	0.25	0.42	2.68
Total crop—												
1913–14	190–3	732	12–8	53	1–1	5	0–6	2	0–5	2	.....	.....
1914–15	177–11	646	7–1	30	0–0	0	1–5	6	41–0	150	18–0	66
1915–16	285–6	1,064	2–15	12	0–0	0	3–4	13	13–10	49	22–7	85
1916–17	217–1	894	12–6	61	0–0	0	1–14	17	5–12	22	12–3	46
Average	217.58	834.00	8.72	39.00	0.27	1.25	1.70	9.50	15.17	55.75	17.54	65.67
Variable fruits—												
1913–14	.....	648	.....	31	.....	5	.....	2	.....	1	.....	.....
1914–15	.....	512	.....	30	.....	0	.....	6	.....	46	.....	64
1915–16	.....	725	.....	6	.....	0	.....	4	.....	20	.....	35
1916–17	.....	564	.....	36	.....	0	.....	1	.....	14	.....	28
Average	.....	612.25	.....	25.75	.....	1.25	.....	3.25	.....	20.25	.....	42.33
Average seeds per fruit—												
1913–14	.....	1.40	.....	3	.....	2	.....	5	.....	4	.....	.....
1914–15	.....	1.83	.....	1	.....	0	.....	1	.....	2	.....	0
1915–16	.....	1.04	.....	2	.....	0	.....	5	.....	1	.....	1
Average	.....	1.55	.....	1.78	.....	2.00	.....	3.50	.....	2.00	.....	0.25
121. Dense-Unproductive strain:												
Green grade—												
1913–14	124–2	465	13–6	50	1–0	4	0–4	1	1–1	4	.....	.....
1914–15	155–8	562	0–12	3	0–0	0	2–13	11	42–3	155	25–0	89
1915–16	190–4	707	1–10	6	0–0	0	1–1	4	7–0	26	19–8	71
1916–17	78–10	316	4–11	19	0–0	0	0–13	3	1–9	6	4–6	17
Average	137.13	512.50	5.11	19.50	0.25	1.00	1.23	4.75	12.95	47.75	16.29	59.00

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
.....	101	.....	163	.....	150	.....	37	.....	.....	.....	18	.....	3
.....	108	.....	153	.....	96	.....	80	.....	.....	.....	95	.....	30
.....	119	.....	235	.....	193	.....	49	.....	124	.....	49	.....	26
.....	110	.....	60	.....	190	.....	125	.....	.....	.....	237	.....	40
.....	87.60	.....	152.75	.....	157.25	.....	72.75	.....	124.00	.....	57.00	.....	24.75
.....	4	.....	0	.....	1	.....	2	.....	.....	.....	1	.....	0
.....	0	.....	0	.....	1	.....	1	.....	.....	.....	1	.....	0
.....	3	.....	2	.....	1	.....	1	.....	1	.....	2	.....	2
.....	2.29	.....	0.88	.....	0.57	.....	1.14	.....	0.67	.....	1.56	.....	0.75
8–13	34	39– 2	153	79–10	295	29– 8	112	.....	.....	12–14	50	2– 2	8
20–11	74	30– 5	113	30– 1	102	10–12	39	.....	.....	7–12	26	6–13	22
56–14	202	70– 3	271	29– 8	115	16– 4	56	33–12	117	11–15	41	10– 6	36
19–11	74	9– 4	36	35– 8	129	22– 8	81	.....	.....	53– 2	195	0–12	3
21.21	76.80	37.22	143.25	43.67	160.25	19.75	72.00	33.75	117.00	12.24	44.57	5.02	17.25
0– 4	1	0– 0	0	0– 0	0	0– 4	1	.....	.....	0– 9	3	0– 8	2
0– 4	1	0– 4	1	0– 3	1	0–10	3	.....	.....	0–15	4	0–12	3
0– 0	0	0– 0	0	0– 0	0	0– 0	0	1– 1	4	1– 0	5	0– 0	0
0– 0	0	0– 6	2	0–13	3	3–10	14	.....	.....	8–11	35	0– 0	0
0.10	0.40	0.16	0.75	0.25	1.00	1.13	4.50	1.06	4.00	1.60	6.71	0.31	1.25
0– 2	1	0– 0	0	1– 8	7	0– 3	1	.....	.....	0– 4	1	0– 4	1
0– 3	1	0– 3	1	0– 8	2	0– 0	0	.....	.....	0– 0	0	0– 1	1
0–14	4	0– 3	1	7–14	38	0– 0	0	0–14	4	2– 2	9	0– 4	2
0– 4	2	0– 4	2	12– 2	71	0– 5	2	.....	.....	10–12	55	6– 14	44
0.29	1.60	0.16	1.00	5.50	29.50	0.13	0.75	0.88	4.00	1.88	9.29	1.86	12.00
9– 3	36	39– 2	153	81– 2	302	29–15	114	.....	.....	13–11	54	2–14	11
21– 2	76	30–12	115	30–12	105	11– 6	42	.....	.....	8–11	30	7–10	26
57–12	206	70– 6	272	37– 6	153	16– 4	56	35–11	125	15– 1	55	10–10	38
19–15	76	9–14	40	48– 7	203	26– 7	97	.....	.....	72– 9	285	7–10	47
21.60	**78.80**	**37.53**	**145.00**	**49.42**	**190.75**	**21.00**	**77.25**	**35.69**	**125.00**	**15.71**	**60.57**	**7.19**	**30.50**
.....	28	.....	137	.....	281	.....	111	.....	.....	.....	43	.....	9
.....	52	.....	113	.....	105	.....	42	.....	.....	.....	29	.....	25
.....	132	.....	219	.....	100	.....	50	.....	103	.....	31	.....	25
.....	60	.....	28	.....	123	.....	89	.....	.....	.....	151	.....	34
.....	54.40	.....	124.25	.....	152.25	.....	73.00	.....	103.00	.....	36.28	.....	23.25
.....	2	.....	0	.....	0	.....	0	.....	.....	.....	3	.....	1
.....	3	.....	0	.....	0	.....	4	.....	.....	.....	5	.....	3
.....	1	.....	0	.....	0	.....	0	.....	0	.....	0	.....	1
.....	2.29	.....	0	.....	0	.....	1.50	.....	0	.....	2.50	.....	1.50
13–10	52	27– 1	105	46– 5	168	16–12	63	.....	.....	3–15	15	0–12	3
23– 7	84	20– 6	77	16–11	59	8–13	31	.....	.....	11– 6	39	4– 1	14
43– 6	157	40– 1	156	26– 2	100	14– 0	52	22–13	82	10– 9	38	4– 2	15
10–13	41	4–11	18	16–13	64	4–14	18	.....	.....	30– 0	130	0– 0	0
18.25	66.80	23.05	89.00	26.48	97.75	11.11	41.00	22.81	82.00	7.98	31.71	2.23	8.00

TABLE III.—*Detailed statement of the annual performance of 25 representative lemon*

Rank in Table I, strain, grade, and season.	Total.		July.		August.		September.		October.		November.	
	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
121. Dense-Unproductive strain—Continued.												
Tree-Ripe grade—												
1913–14	8– 0	39	3– 0	16	0– 5	2	0– 4	1	0–11	3	.....	.....
1914–15	6–12	27	0–14	4	0– 0	0	0– 0	0	0– 0	0	0– 0	0
1915–16	11– 8	52	0– 4	1	0– 0	0	0–11	4	0–14	4	0– 8	3
1916–17	16–12	80	0– 9	3	0– 0	0	0– 0	0	0– 3	1	0– 4	1
Average	10. 75	49. 50	1. 17	6. 00	0. 08	0. 50	0. 23	1. 25	0. 44	2. 00	0. 25	1. 33
Cull grade—												
1913–14	3– 1	19	0– 6	3	0– 0	0	0– 0	0	0– 6	2	.....	.....
1914–15	2–14	16	0–12	4	0– 0	0	0– 3	1	0– 9	2	0– 0	0
1915–16	21– 1	106	0– 8	2	0– 3	1	1– 1	6	0– 3	1	0– 4	2
1916–17	20– 8	126	0– 5	2	0– 8	4	0– 0	0	0– 5	2	0– 0	0
Average	11. 88	66. 75	0. 48	2. 75	0. 17	1. 25	0. 31	1. 75	0. 36	1. 75	0. 08	0. 67
Total crop—												
1913–14	135– 3	523	16–12	69	1– 5	6	0– 8	2	2– 2	9	.....	.....
1914–15	165– 2	605	2– 6	11	0– 0	0	3– 0	12	42–12	157	25– 0	89
1915–16	222–13	865	2– 6	9	0– 3	1	2–13	14	8– 1	31	20– 4	76
1916–17	115–14	522	5– 9	24	0– 8	4	0–13	3	2– 1	9	4–10	18
Average	**159. 75**	**628. 75**	**6. 77**	**28. 25**	**0. 50**	**2. 75**	**1. 78**	**7. 75**	**13. 75**	**51. 50**	**16. 63**	**61. 00**
Variable fruits—												
1913–14	.....	411	.....	59	.....	5	.....	2	.....	7	.....	.....
1914–15	.....	474	.....	11	.....	0	.....	12	.....	40	.....	89
1915–16	.....	556	.....	3	.....	0	.....	2	.....	16	.....	36
1916–17	.....	293	.....	21	.....	0	.....	2	.....	2	.....	12
Average	.....	433. 50	.....	23. 50	.....	1. 25	.....	4. 50	.....	16. 25	.....	45. 67
Average seeds per fruit—												
1913–14	.....	3. 48	.....	3	.....	3	.....	5	.....	2	.....	.....
1914–15	.....	2. 36	.....	2	.....	0	.....	3	.....	0	.....	0
1915–16	.....	1. 35	.....	1	.....	1	.....	2	.....	4	.....	0
Average	.....	2. 29	.....	2. 11	.....	2. 33	.....	3. 29	.....	2. 13	.....	0

trees of the Lisbon variety for the 6-year period from July, 1913, to June, 1917—Contd.

December.		January.		February.		March.		April.		May.		June.	
Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.	Weight.	Number.
0- 3	2	0- 0	0	0- 0	0	1- 0	4	.....	.....	1- 8	7	1- 1	4
0- 0	0	0- 0	0	0-12	3	1- 8	6	.....	.....	1- 4	5	2- 6	9
0- 4	1	0- 0	0	0- 0	0	0- 0	0	1-11	7	5- 3	23	2- 1	9
0- 3	1	1-11	9	0- 9	2	3- 5	13	.....	.....	10- 0	50	0- 0	0
0.13	0.80	0.42	2.25	0.33	1.25	1.45	5.75	1.69	7.00	2.56	12.14	1.38	5.50
0- 8	3	0- 4	2	0- 9	3	0- 4	2	.....	.....	0-12	4	0- 0	0
0- 0	0	0- 4	2	0- 2	1	0- 0	0	.....	.....	0-10	4	0- 6	2
0- 4	1	1-13	10	11- 3	55	0- 5	2	2- 2	11	2-11	12	0- 8	3
0- 4	2	0- 4	2	4- 8	28	0- 0	0	.....	.....	10- 0	54	4- 6	32
0.20	1.20	0.64	4.00	4.09	21.75	0.14	1.00	2.12	11.00	2.01	10.57	1.31	9.25
14- 5	57	27- 5	107	46-14	171	18- 0	69	.....	.....	6- 3	26	1-13	7
23- 7	84	20-10	79	17- 9	63	10- 5	37	.....	.....	13- 4	48	6-13	25
43-14	159	41-14	166	37- 5	155	14- 5	54	26-10	100	18- 7	73	6-11	27
11- 4	44	6-10	29	21-14	94	8- 3	31	.....	.....	50- 0	234	4- 6	32
18.58	**68.80**	**24.11**	**95.25**	**30.91**	**120.75**	**12.70**	**47.75**	**26.63**	**100.00**	**12.55**	**54.43**	**4.92**	**22.75**
.....	44	.....	84	.....	133	.....	54	.....	.....	.....	18	.....	5
.....	78	.....	77	.....	63	.....	37	.....	.....	.....	44	.....	23
.....	107	.....	126	.....	83	.....	36	.....	79	.....	49	.....	19
.....	35	.....	14	.....	61	.....	22	.....	.....	.....	104	.....	20
.....	52.80	.....	75.25	.....	85.00	.....	37.25	.....	79.00	.....	30.71	.....	16.75
.....	4	.....	4	.....	3	.....	4	.....	.....	.....	5	.....	3
.....	1	.....	2	.....	4	.....	3	.....	.....	.....	2	.....	3
.....	0	.....	1	.....	2	.....	0	.....	1	.....	1	.....	3
.....	2.00	.....	1.80	.....	3.33	.....	2.29	.....	0.33	.....	2.56	.....	3.13

TABLE IV.—*Number of variable fruits of different forms produced during the investigational performance-record period on the 25 individual lemon trees of the Lisbon variety listed in Table III.*

[These data are for the 4-year period from July, 1913, to June, 1917, inclusive, except that the records for the trees of the Bull strain are for the 3-year period from July, 1914, to June, 1917, inclusive. The several trees are designated by numbers denoting their rank (as shown in Table III), the strain to which each belongs being indicated by abbreviations, as follows: B=Bull, DU=Dense-Unproductive, L=Lisbon, O=Open, S=Sporting.]

Description of fruit variations.	Tree designations by rank and strain.												
	1, L.	5, B.	6, L.	10, B.	13, L.	17, L.	22, S.	24, B.	26, L.	29, O.	39, O.	50, O.	57, B.
Collared	1,976	1,828	1,746	1,850	1,633	1,927	1,252	1,415	1,513	931	1,007	897	1,324
Protruding blossom end	598	393	697	356	535	505	425	501	427	264	337	254	367
Collared and protruding	1,216	734	1,087	601	1,148	804	788	762	667	481	451	397	610
Bottle shape	109	3	54	6	93	33	95	.....	21	44	61	62	7
Raised section	9	.....	19	.....	10	18	12	2	13	11	2	5	8
Raised ridge	49	29	57	37	48	39	54	43	40	32	14	20	32
Ridged	90	134	111	121	81	196	235	150	141	51	36	49	107
Ridged and collared	70	43	64	49	76	108	610	40	36	33	36	29	77
Ridged and protruding	41	26	63	36	38	80	56	29	45	8	5	15	24
Ridged, collared, and protruding	55	41	70	36	52	70	160	56	22	7	12	4	58
Sunken section	3	.....	6	1	5	5	11	2	3	4	.....	1	1
Creased	23	22	36	20	17	40	14	16	43	23	23	18	33
White section	1	.....	.....	.....	.....	3	.....	1	1	.....	.....	.....	.....
Striped	.....	1	5	.....	1	9	2	.....	7	.....	.....	.....	35
Striped section	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Ribbed	.....	.....	11	1	2	2	95	1	4	.....	.....	.....	1
Corrugated	6	.....	13	.....	15	14	969	.....	6	.....	.....	.....	60
Abnormal shape	5	3	4	1	1	2	2	2	3	1	1	1	1
Miscellaneous variations	8	26	17	27	14	14	25	31	20	.....	6	.....	25
Total	4,259	3,283	4,060	3,142	3,769	3,869	4,805	3,051	3,012	1,890	1,991	1,752	2,832
Percentage of total crop	36.7	43.3	39.2	42.7	36.2	39.3	50.6	44.9	32.8	19.9	22.2	19.5	48.0

Description of fruit variations.	Tree designations by rank and strain.											
	59, O.	67, O.	75, O.	76, L.	81, S.	85, O.	93, O.	101, O.	113, O.	114, DU.	117, DU.	121, DU.
Collared	889	626	677	719	1,251	450	754	363	367	817	473	266
Protruding blossom end	249	247	253	279	498	826	120	151	154	12	8	5
Collared and protruding	471	306	316	382	740	514	318	105	85	2	6	29
Bottle shape	47	52	36	46	63	4	106	11	25	183	156	150
Raised section	5	5	5	3	10	5	5	.....	1	3	31	1
Raised ridge	25	20	20	12	75	20	13	6	4	68	45	21
Ridged	39	42	30	36	168	68	44	22	25	378	370	281
Ridged and collared	30	23	17	30	151	18	21	7	2	1,403	1,318	942
Ridged and protruding	14	11	15	13	30	32	7	15	11	2	1	1
Ridged, collared, and protruding	7	8	6	11	68	5	5	2	2	2	6	6
Sunken section	1	2	1	.....	3	1	.....	1	.....	2	4	3
Creased	30	18	11	15	12	21	20	10	7	23	8	9
White section	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Striped	1	.....	.....	.....	13	.....	.....	.....	.....	27	2	1
Striped section	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Ribbed	.....	.....	.....	.....	9	.....	.....	.....	.....	9	9	12
Corrugated	.....	.....	.....	.....	152	.....	.....	.....	.....	3	2	.....
Abnormal shape	3	.....	2	2	1	4	.....	2	5	6	2	2
Miscellaneous variations	2	4	5	2	23	9	2	4	3	16	8	5
Total	1,813	1,365	1,394	1,550	3,268	1,977	1,415	699	691	2,956	2,449	1,734
Percentage of total crop	21.6	16.1	17.2	20.2	47.7	25.6	18.8	9.6	11.3	70.4	73.4	68.9

The collared and ridged forms recorded for the trees of the Dense-Unproductive strain are characteristic of that strain. They vary somewhat from the fruits on the other trees listed under the same

designations, but have been recorded under the same names. The fruits of the Bull strain are typically somewhat collared and inclined to be ridged, but only the fruits which showed those characteristics in a marked degree were recorded in those classes during these studies. The trees of the Open strain produce less fruit of these fluctuating forms than any of the other strains of the Lisbon variety which have been studied.

In Table V are recorded the dates on which each picking was made from the trees in the Lisbon study plat during the four years, July, 1913, to June, 1917, inclusive. An attempt was made to obtain the picking records at intervals of 30 days. Unavoidable delays, however, were sometimes occasioned by unfavorable conditions of climate, by interfering periods of irrigation, or by other causes. Unfavorable weather conditions during the winter season often delayed the progress of the work from a day to several weeks. At four times during the period from July, 1913, to June, 1917, it was impossible to make a picking at the proper time. In April, 1915, owing to certain conditions in the orchard, it was thought best to begin the picking from the side of the plat opposite to that which had been the previous practice. This made about a 30-day interval between the first trees picked at that time and an increasing interval up to nearly two months for the rest of the plat. The trees picked first were credited with an April yield, but with no picking in May. The trees picked during the latter part of that period were listed with a crop in May, but with no picking in April.

TABLE V.—*Dates on which fruit was picked from the lemon trees of the Lisbon variety in the investigational performance-record plat from July, 1913, to June, 1917, inclusive.*

[When this plat was selected the trees had not been picked for about five weeks, so the records were begun on them at once and credited as the July crop.]

Month.	First and last date of each picking period.			
	1913–14	1914–15	1915–16	1916–17
July	June 27 to July 2	July 15 to 20	July 3 to 17	July 20 to 25.
August	Aug. 13 to 16	Aug. 18 to 21	Aug. 10 to 13	Aug. 21 to 26.
September	Sept. 13 to 17	Sept. 22 to 25	Sept. 9 to 14	Sept. 26 and 27.
October	Oct. 27 to 29	Oct. 26 to 31	Oct. 12 to 14	Oct. 23 to 25.
November		Nov. 23 to 28	Nov. 11 and 12	Nov. 20 to 22.
December	Dec. 9 to 11	Dec. 23 to 30	Dec. 10 to 15	Dec. 20 to 24.
January	Jan. 3 to 19	Jan. 15 to Feb. 1	Jan. 7 to 20	Jan. 22 to 25.
February	Feb. 16 to Mar. 6	Feb. 24 to Mar. 3	Feb. 8 to 14	Feb. 23 to 28.
March	Mar. 24 to Apr. 2	Mar. 17 to 25	Mar. 8 to 13	Mar. 28 to Apr. 5.
April			Apr. 12 to 17	
May	May 5 to 13	Apr. 27 to May 10 [a]	May 10 to 13	May 15 to 18.
June	June 3 to 8	June 2 to 9	June 2 to 5 [b]	July 6 to 7. [c]

[a] Owing to delay caused by irrigation and cultivation the order of picking the trees was here reversed and the new order was followed in all subsequent work. The trees which were picked on March 25 at the end of the March picking were picked again on April 27, while those picked on March 17 were not picked again until May 10.

[b] The 15 trees on the western section of the plat were not picked until June 19 and 20.

[c] The 15 trees on the western section of the plat were not picked in April or May, but were picked on June 18 and 19.

Table VI presents the average annual yield of the lemon trees of the various strains of the Lisbon variety in the investigational plat, showing their total crops and the yields of Green, Tree-Ripe, and Cull fruits. Figure 4 shows these data graphically, and the percentage of fruit of each grade is shown in Table VII. The Lisbon strain is seen to be the most productive one. The Bull strain is very nearly as productive and bore a higher proportion of green fruit, but the lower quality and poor appearance of the fruit of that strain make it much less desirable than that of the Lisbon strain. The low average of the Dense-Unproductive strain and its high percentage of Green-grade fruit is particularly noticeable. Every tree of this strain produced more fruit of the Cull grade than of the Tree-Ripe grade. The fruit borne by the trees of this strain is of very little value commercially. The trees of all the strains except the Open strain are characterized by a dense or semidense habit of growth, and the effect of this condition is reflected in the percentage of fruit of the Cull grade produced

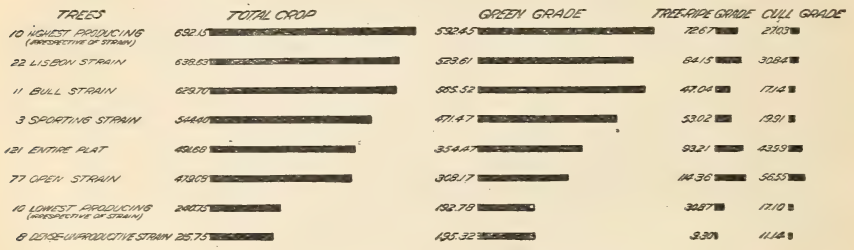


FIG. 4.—Diagram showing the average annual total crops and the weight of fruit of the different commercial grades produced by the trees of the several strains of the Lisbon lemon occurring in the investigational performance-record plat during the 4-year period from July, 1913, to June, 1917, inclusive. The data for the trees of the Bull strain and three other trees, as indicated in Table I, cover only three years. The strains are ranked according to the weight of their average total crops.

by the trees of the different strains. Table VII shows the trees of the Open strain to have had 11.8 per cent of fruit of the Cull grade, the next highest proportion, 5.16 per cent, being borne by the trees of the Dense-Unproductive strain.

The last two columns of Table VII show the average number and percentage of variable fruits produced by the trees of the different strains during the performance-record period. While all except the Open strain are shown to bear very large percentages of fruit of variable forms, the greater proportion of them on the trees of the Bull, Lisbon, and Open strains are of the fluctuating type previously described. The fruits of the Dense-Unproductive strain are practically all of forms characteristic of that strain, and the trees of the Sporting strain produce a relatively large percentage of fruit which differs very markedly from the typical fruit of the variety. Figure 5 shows graphically the variations between the different strains in the percentage of variable fruit produced.

TABLE VI.—*Average annual crop of the individual lemon trees of several of the important strains occurring in the investigational performance-record plat of the Lisbon variety, ranked according to the weight of their average total crops.*

[This is a summary of data for the 4-year period from July, 1913, to June, 1917, inclusive, except that the data for the trees of the Bull strain and three other trees, as indicated in Table I, cover only the 3-year period from July, 1914, to June, 1917, inclusive.]

Number of trees.	Description of trees.	Average annual production per tree.							
		Total crop.		Green grade.		Tree-Ripe grade.		Cull grade.	
		Pounds.	Number.	Pounds.	Number.	Pounds.	Number.	Pounds.	Number.
10	Highest producing (irrespective of strain)	692.15	2,614.03	592.45	2,147.05	72.67	302.08	27.03	164.90
22	Lisbon strain	638.63	2,482.99	523.61	1,925.63	84.15	363.27	30.84	194.09
11	Bull strain	629.70	2,307.79	565.52	2,020.21	47.04	187.85	17.14	99.73
3	Sporting strain	544.40	2,032.75	471.47	1,703.50	53.02	209.33	19.91	119.92
121	Entire plat	491.68	1,994.11	354.47	1,304.37	93.21	412.48	43.99	277.26
77	Open strain	479.08	2,012.22	308.17	1,142.07	114.36	512.05	56.55	358.10
10	Lowest producing (irrespective of strain)	240.75	957.80	192.78	712.40	30.87	139.75	17.10	105.65
8	Dense - Unproductive strain	215.75	822.84	195.32	718.44	9.30	39.12	11.14	65.28

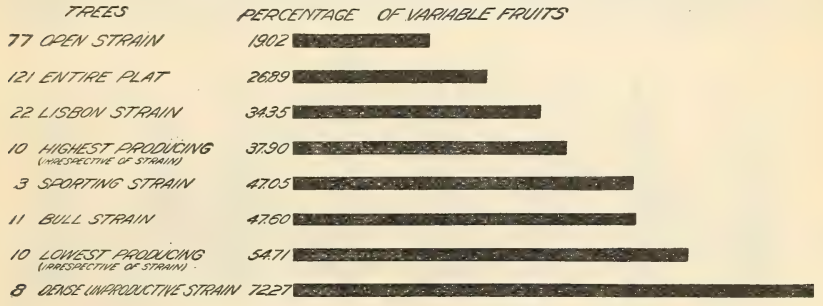


FIG. 5.—Diagram showing the percentage of variable fruits of the Lisbon lemon occurring on the trees of the different strains in the investigational performance-record plat during the 4-year period from July, 1913, to June, 1917, inclusive. The data for the trees of the Bull strain and three other trees, as indicated in Table I, cover only three years. The proportions are based on the number of fruits produced.

TABLE VII.—*Production of fruit of the three different grades and of variable fruits picked from the lemon trees of the several strains of the Lisbon variety in the investigational performance-record plat during the 4-year period from July, 1913, to June, 1917, inclusive.*

[The strains are ranked according to their proportion (by weight) of fruit of the Green grade.]

Number of trees.	Description of trees.	Percentage of weight of total crop.			Variable fruits.	
		Green grade.	Tree-Ripe grade.	Cull grade.	Average yearly number per tree.	Per cent.
8	Dense-Unproductive strain	90.53	4.31	5.16	594.56	72.27
11	Bull strain	89.81	7.47	2.72	1,098.67	47.60
3	Sporting strain	86.60	9.74	3.66	956.50	47.05
10	Highest producing (irrespective of strain)	85.59	10.50	3.91	990.60	37.90
22	Lisbon strain	81.99	13.18	4.83	853.02	34.35
10	Lowest producing (irrespective of strain)	80.07	12.82	7.10	524.00	54.71
121	Entire plat	72.09	18.96	8.95	536.26	26.89
77	Open strain	64.33	23.87	11.80	382.75	19.02

Table VIII and figures 6, 7, and 8 show some of the recorded variations in season of production of fruit of the Green and Tree-Ripe grades by the trees of the various strains in the Lisbon study plat. These figures include the records for the 3-year period from July, 1914, to June, 1917, inclusive, instead of for the entire four years, so as to make the data more closely comparable with the similar studies on the Eureka variety.[1] Pickings were made each month during these three years except in April, 1915, and again in April, 1917, as shown

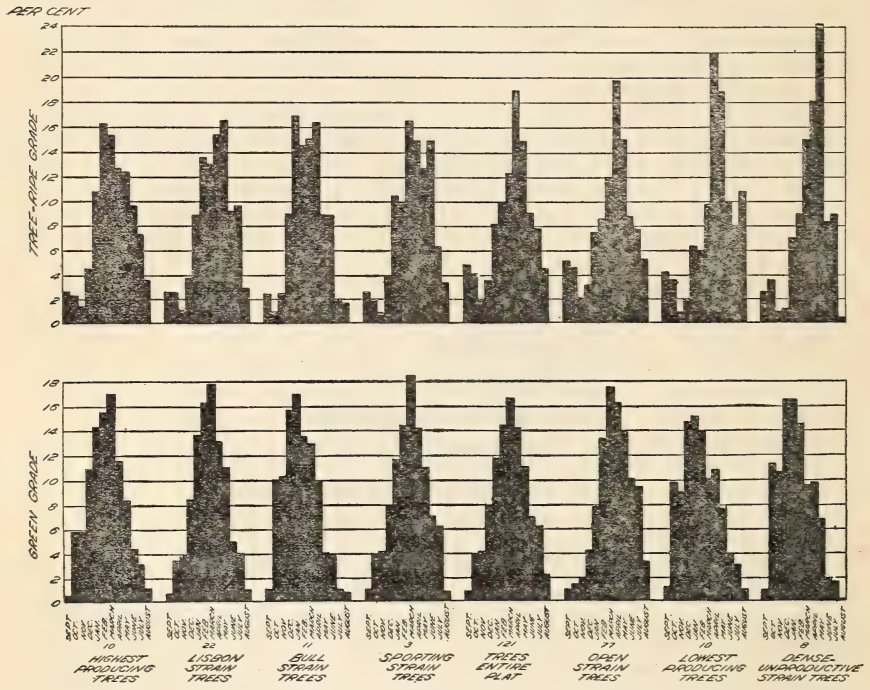


FIG. 6.—Diagram showing the percentage of the total yield of fruit of Lisbon lemons of the Green and Tree-Ripe grades, by weight, which was produced each month by the trees of the various strains in the investigational performance-record plat during the 3-year period from July, 1914, to June, 1917, inclusive. The strains are arranged from left to right in the order of their rank for total production, as shown in Table V.

in Table V. No picking was made from the 14 trees in rows 56 and 57 in April or May, 1917. Although it was certain that at that season the amount picked from the trees was not equal each month, the only possible procedure was to credit the fruit equally to the months in question.

The size of the picking ring used for fruit of the Green grade during the 4-year period is shown in Table IX. The fruit of the Tree-Ripe grade was usually "cleaned up" in April and May in this orchard.

[1] See U. S. Dept. of Agriculture Bul. 813, entitled "Citrus Fruit Improvement: A Study of Bud Variation in the Eureka Lemon."

Table VIII shows the average monthly production of fruit of the Green and Tree-Ripe grades by the trees of the various strains and also presents these same data in terms of monthly percentages of the average annual production of each grade. In this latter form the data for the various strains are directly comparable, showing the variations between the strains in season of bearing. These variations are more clearly presented in figures 6 and 7. In figure 6 the monthly percentages of production are grouped by strains.

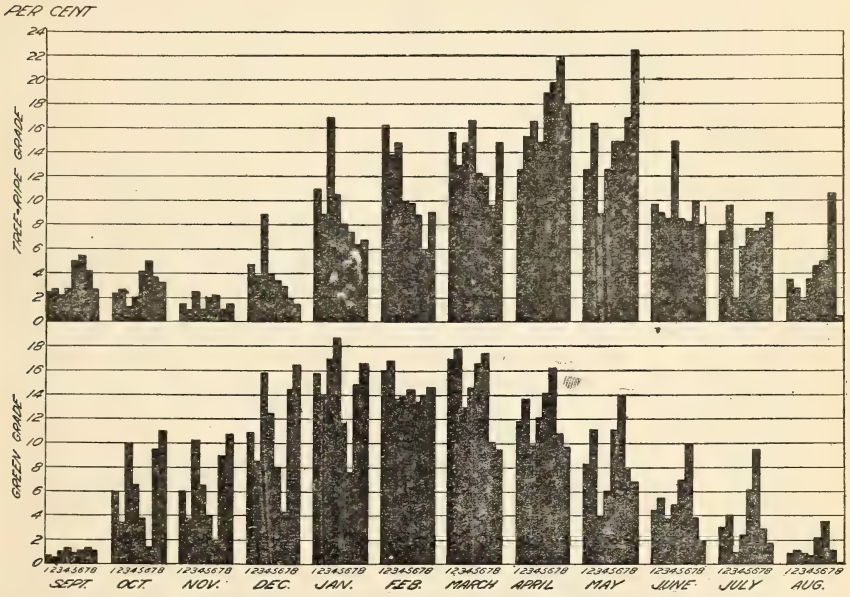


FIG. 7.—Diagram showing the percentage of the total yield of fruit of Lisbon lemons of the Green and Tree-Ripe grades, by weight, which was produced each month by the trees of the various strains in the investigational performance-record plat during the 3-year period from July, 1914, to June, 1917, inclusive. These are the same data that are presented in figure 6, being here rearranged to show more clearly the variations between the different strains each month. The strains are listed from left to right in the same order as in figure 6. Arrangement of strains: *1*, 10 highest producing trees; *2*, 22 trees of the Lisbon strain; *3*, 11 trees of the Bull strain; *4*, 3 trees of the Sporting strain; *5*, 121 trees—entire plat; *6*, 77 trees of the Open strain; *7*, 10 lowest producing trees; *8*, 8 trees of the Dense-Unproductive strain.

The trees of the Lisbon strain are shown to have borne most heavily of fruit of the Green grade in January, February, March, and April, being at their maximum in March, although Table V shows that the interval between the February and March pickings in 1915 was only 21 days and Table IX shows that the picking ring was increased in size in March, 1916. The trees of the Bull strain produced the largest crops of the Green grade in December, January, February, and March, being at their maximum in January, a condition partly due to the fact that, as shown in Table IX, the size of the picking ring was reduced in that month in two of the three years, although it was increased in size in that month in the third year. The trees of the Open strain bore most heavily of fruit of the Green grade in February, March, April, and May, being heaviest in March, like the

trees of the Lisbon strain. The trees of the Dense-Unproductive strain bore the most of their fruit of the Green grade from October to February, inclusive, yielding their heaviest crops in December and January.

TABLE VIII.—*Average yield and percentages of total yield of fruit of the Green and Tree-Ripe grades picked each month from the lemon trees of the various strains of the Lisbon variety in the investigational performance-record plat during the 3-year period from July, 1914, to June, 1917, inclusive.*

[The strains are listed in the order of their total-production rank for 4 years, as shown in Table VI.]

Description of trees.	Number of trees.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	Total.
PRODUCTION (IN POUNDS) AVERAGE.														
Green grade:														
Highest producing (irrespective of strain)	10	18.52	5.55	3.60	35.34	35.81	66.23	89.05	96.45	101.42	70.81	50.37	26.60	599.75
Lisbon strain	22	21.95	5.84	2.86	18.23	20.40	45.65	74.42	88.79	94.85	72.71	60.03	27.11	532.86
Bull strain	11	6.95	5.10	6.08	56.13	58.09	89.16	96.35	77.12	74.42	56.04	22.60	20.82	568.85
Sporting strain	3	11.92	3.94	6.53	33.63	32.17	61.76	90.83	68.14	71.63	60.25	30.41	23.50	494.72
Entire plat	121	21.42	7.49	3.33	13.23	14.26	27.57	40.03	50.05	57.28	49.27	39.01	24.75	347.71
Open strain	77	25.57	9.20	3.06	3.85	4.77	11.60	20.81	36.45	47.46	44.22	38.31	26.85	272.16
Lowest producing (irrespective of strain)	10	5.68	2.31	2.38	18.90	17.90	28.53	29.67	27.57	19.48	20.76	15.37	7.33	195.87
Dense-Unproductive strain	8	3.44	.17	2.31	23.19	21.65	34.09	33.98	30.45	19.53	19.99	13.80	3.95	206.54
Tree-Ripe grade:														
Highest producing (irrespective of strain)	10	6.26	2.93	2.07	1.91	1.33	3.90	9.32	13.67	13.05	10.68	10.58	8.10	83.79
Lisbon strain	22	9.67	2.96	2.59	2.63	1.32	3.84	9.16	13.66	13.32	15.52	16.50	9.31	100.50
Bull strain	11	.95	.80	1.09	.59	1.11	4.22	8.15	6.92	7.01	7.73	4.23	4.24	47.04
Sporting strain	3	3.99	2.19	1.63	1.33	.74	2.58	6.68	6.27	10.42	9.44	8.06	9.53	62.85
Entire plat	121	8.16	4.85	4.99	4.43	2.03	3.69	8.69	10.28	13.07	19.86	15.94	9.35	105.33
Open strain	77	9.67	6.57	6.86	6.03	2.60	3.97	9.53	10.92	15.16	25.10	19.15	10.97	126.54
Lowest producing (irrespective of strain)	10	2.58	3.63	1.42	1.22	.38	.60	2.18	1.90	3.21	7.39	5.74	3.40	33.66
Dense-Unproductive strain	8	.93	.04	.26	.36	.15	.16	.71	.97	1.56	1.89	2.57	.86	10.45
PERCENTAGE OF WEIGHT OF TOTAL CROP.[1]														
Green grade:														
Highest producing (irrespective of strain)	10	3.1	.9	.6	5.9	6.0	11.0	14.8	16.1	16.9	11.8	8.4	4.4	16.8
Lisbon strain	22	4.1	1.1	.5	3.4	3.8	8.5	14.0	16.7	17.8	13.6	11.3	5.1	21.6
Bull strain	11	1.2	.9	1.1	9.9	10.2	15.7	16.9	13.6	13.1	9.8	4.0	3.7	9.8
Sporting strain	3	2.4	.8	1.3	6.7	6.5	12.5	18.4	13.8	14.5	12.2	6.1	4.8	14.1
Entire plat	121	6.2	2.2	.9	3.8	4.1	7.9	11.5	14.4	16.5	14.2	11.2	7.1	26.7
Open strain	77	9.4	3.4	1.1	1.4	1.8	4.3	7.6	13.4	17.4	16.2	14.1	9.9	36.8
Lowest producing (irrespective of strain)	10	2.9	1.2	1.2	9.6	9.1	14.6	15.1	14.1	10.0	10.6	7.8	3.7	15.6
Dense-Unproductive strain	8	1.7	.1	1.1	11.2	10.5	16.5	16.5	14.7	9.5	9.7	6.7	1.9	10.4
Tree-Ripe grade:														
Highest producing (irrespective of strain)	10	7.5	3.5	2.5	2.3	1.6	4.7	11.1	16.3	15.6	12.7	12.6	9.7	33.3
Lisbon strain	22	9.6	2.9	2.6	2.6	1.3	3.8	9.1	13.6	13.3	15.4	16.4	9.3	38.2
Bull strain	11	2.0	1.7	2.3	1.3	2.4	9.0	17.3	14.7	14.9	16.4	9.0	9.0	21.7
Sporting strain	3	6.4	3.5	2.6	2.1	1.2	4.1	10.6	10.0	16.6	15.0	12.8	15.2	37.9
Entire plat	121	7.7	4.6	4.7	4.2	1.9	3.5	8.2	9.8	12.4	18.9	15.1	8.9	36.3
Open strain	77	7.6	5.2	5.4	4.8	2.1	3.1	7.5	8.6	12.0	19.8	15.1	8.7	36.6
Lowest producing (irrespective of strain)	10	7.7	10.8	4.2	3.6	1.1	1.8	6.5	5.7	9.5	21.9	17.1	10.1	45.7
Dense-Unproductive strain	8	8.9	.4	2.5	3.4	1.4	1.5	6.8	9.3	14.9	18.1	24.6	8.2	42.1

[1] The season percentage is calculated on the production for the 4 months, May to August, inclusive.

TABLE IX.—*Diameter of rings used in picking fruits of the Green grade from the lemon trees of the Lisbon variety in the investigational performance-record plat during the 4-year period from July, 1913, to June, 1917, inclusive.*

Month.	Diameter of picking ring for Green-grade fruit (inches).				Month.	Diameter of picking ring for Green-grade fruit (inches).			
	1913–14	1914–15	1915–16	1916–17		1913–14	1914–15	1915–16	1916–17
July	2 8/32	2 8/32	2 8/32	2 10/32	January	2 8/32	2 8/32	2 9/32	2 10/32
August	2 8/32	2 8/32	2 8/32	2 10/32	February	2 8/32	2 10/32	2 9/32	2 10/32
September	2 10/32	2 8/32	2 10/32	2 10/32	March	2 10/32	2 10/32	2 10/32	2 10/32
October	2 10/32	2 8/32	2 10/32	2 10/32	April	.....	.....	2 10/32	.....
November	.....	2 10/32	2 10/32	2 9/32	May	2 8/32	2 10/32	2 10/32	2 8/32
December	2 10/32	2 10/32	2 10/32	2 9/32	June	2 8/32	2 10/32	2 10/32	2 8/32

In figure 7 the data are rearranged to show more clearly the variations between the various strains during the different months. The differences would be best illustrated by representing the production for each strain by a curve, but on account of the nature of the resulting

FIG. 8.—Diagram showing the percentage of the total crops of fruit of Lisbon lemons of the Green grade which were produced each month by the trees of the Lisbon, Bull, and Open strains in the investigational performance-record plat during the 3-year period from July, 1914, to June, 1917, inclusive.

curves it was impracticable to represent them all clearly on a single small-sized chart. In figure 8 are shown curves for the monthly production of the Green-grade fruit from the trees of the Lisbon, Bull, and Open strains, illustrating their variations during the season of heaviest bearing.

Further study of the seasonal variations in production from the east and west sections of the investigational plat is afforded by Table X, in which the total production at each picking period, including the fruits of the Cull grade, is expressed in terms of field picking boxes. It is interesting to study this table in the light of the data presented in Tables V and IX, showing the picking dates and the sizes of the picking rings used for fruit of the Green grade throughout the period during which these records were obtained. Such study will show the reasons for the variations stated in Table X, which at first appear to be incorrect. For example, during the first three years there is recorded a very heavy increase in yield from December to January, notwithstanding that Table V shows that the intervals between those pickings were less than 30 days. In 1916–17 there was a decrease in production at that period, although the interval between the pickings was 33 days. The explanation is found in Table IX in the use of a ring of a smaller size for the January picking during the first three seasons and the use of a larger sized ring in January, 1917.

TABLE X.—*Total fruit yields of the lemon trees of the Lisbon variety in the investigational performance-record plat for each month during the 4-year period from July, 1913, to June, 1917, inclusive.*

[The yields are expressed in terms of the number of field boxes of fruit. Records on 14 of the trees in the west section of the plat were begun in July, 1914. Eleven of these trees were of the Bull strain.]

Month.	Number of field boxes of fruit produced.						
	East section of plat, 106 trees.				West section of plat, 15 trees.		
	1913–14	1914–15	1915–16	1916–17	1914–15	1915–16	1916–17
July	61½	43½	184	59½	2	6¾	4
August	32½	12½	73½	12	.....	3¼	¼
September	11	15¾	66	11½	6¾	3	2
October	46	48½	26	27	36	2½	14
November	.....	47¾	22	21	19½	9½	25½
December	60	79	57½	53	20	24½	29½
January	200	179	105¾	45½	48	36	16½
February	409	206½	113	192	28	27½	34½
March	204	246	113¾	235	39	25	28
April	.....	.....	140½	.....	29½	34½	.....
May	186	479	117¾	397	.....	12	.....
June	70	237	88½	57½	25	10½	35½
Total	1,279	1,594½	1,108¼	1,111	253¾	195	190
Heaviest	February.	March.....	April.....	March.....	January...	January...	February.
Lightest	September	August....	November	September	July.....	October...	August.

Similarly, Table X shows a decrease in yield from February to March, 1914, with a picking interval of 36 days, and practically no change in the production for that period in 1916, with a picking interval of 30 days, while there was an increase in the crops for that month in 1915 and 1917, with picking intervals of 21 and 33 days, respectively. Table IX shows that a change was made in March, 1914, and

1916, to a picking ring of a larger size, while in 1915 and 1917 no change was made at that time.

The variations in the production of fruit of the Green and Tree-Ripe grades by the trees of the various strains is very forcibly illustrated in Table XI. The average yield for the 3-year period as given in Table VIII is calculated to the acre basis and expressed in terms of packed boxes. This indicates a yield of 585 packed boxes per acre by the 10 highest producing trees, as opposed to 196 packed boxes per acre by the 10 lowest producing trees. The trees of the Lisbon strain show a production at the rate of 542 packed boxes per acre, while the trees of the Dense-Unproductive strain would have borne only 186 packed boxes per acre. The average yield of the 10 highest producing trees was 51 per cent higher than the average for the entire plat, while the average of the 10 lowest producing trees was only 48 per cent of the average of the plat as a whole, or 32 per cent of the average produced by the 10 highest yielding trees.

TABLE XI.—*Annual yields and calculated production per acre of fruit of the Green and Tree-Ripe grades picked from the lemon trees of the various strains of the Lisbon variety in the investigational performance-record plat for the 3-year period from July, 1914, to June, 1917, inclusive, as shown in Table VIII.*

Number of trees.	Description of trees.	Average annual production, 3-year period.					
		Production per tree (pounds).		Calculated production per acre (packed boxes).			Percentage of average of plat.
		Green grade.	Tree-Ripe grade.	Green grade.	Tree-Ripe grade.	Total.	
10	Highest producing (irrespective of strain)	599.75	83.79	513.12	71.69	584.81	150.88
22	Lisbon strain	532.86	100.50	455.89	85.98	541.87	139.80
11	Bull strain	568.85	47.07	486.68	40.25	526.93	135.94
3	Sporting strain	494.72	62.85	423.26	53.77	477.03	123.07
121	Entire plat	347.71	105.33	297.49	90.12	387.61	.....
77	Open strain	272.16	126.54	232.85	108.26	341.11	88.00
10	Lowest producing (irrespective of strain)	195.87	33.66	167.58	28.80	196.38	50.66
8	Dense-Unproductive strain	206.54	10.45	176.71	8.94	185.65	47.90

The average weight per fruit for the total production of fruit of the Green and Tree-Ripe grades from the trees of the various strains in the Lisbon plat is shown in Table XII, and the average weight per fruit of the two grades combined is presented graphically in figure 9. The trees of the Open strain are shown to have produced fruit of the lightest weight, except that the lightest fruits of the Tree-Ripe grade borne by the trees of any strain were from the 10 lowest producing trees, which include the 8 Dense-Unproductive ones and the 2 lowest producing trees of the Open strain. The trees of the Bull strain produced the heaviest green fruit and the heaviest average weight of the combined grades. These trees also bear very

large crops, averaging only slightly below the trees of the Lisbon strain in the investigational plat. This combination of high production and heavy individual fruits which grow very rapidly and

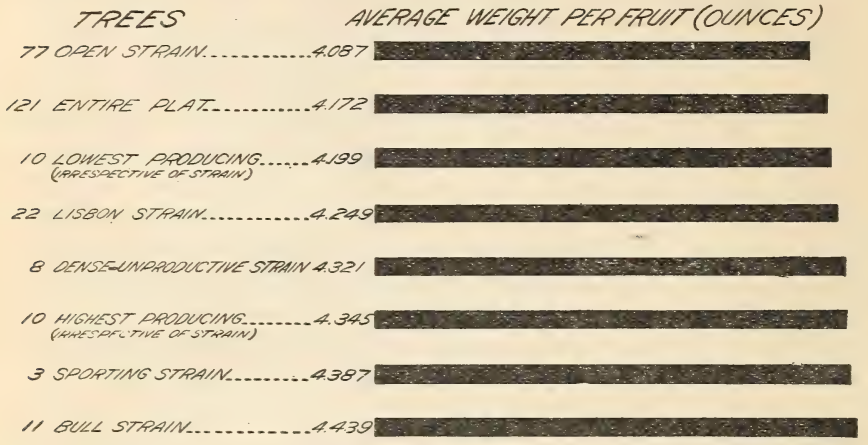


FIG. 9.—Diagram showing the average weight per fruit of the Lisbon lemon of the Green and Tree-Ripe grades borne by the trees of the various strains occurring in the investigational performance-record plat. These weights are expressed in ounces and are based on data for the 4-year period from July, 1913, to June, 1917, inclusive, except as noted in Table I.

are thick skinned is probably due, in part at least, to the excessively vigorous and rapid growth of the trees of this strain.

Figure 10 shows the average seed content of the fruits of the various strains in the Lisbon investigational plat. The fruits of

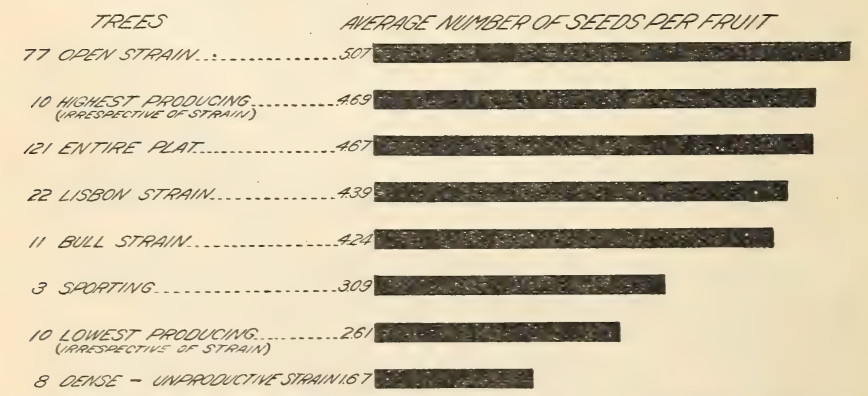


FIG. 10.—Diagram showing the average number of seeds per fruit found on lemon trees of various strains of the Lisbon variety in the investigational performance-record plat. This is a summary of the data recorded during the 3-year period from July, 1913, to June, 1916, inclusive, except as noted in Table XI.

the Open strain averaged 5.07 seeds, while those of the Dense-Unproductive strain averaged only 1.67 seeds. The data show that a seed content of about 4.39 is characteristic of the Lisbon strain.

TABLE XII.—*Average weight per fruit for lemons of the Green and Tree-Ripe grades produced by the trees of the various strains of the Lisbon lemon in the investigational performance-record plat.*

[These data cover the 4-year period from July, 1913, to June, 1917, inclusive, except as noted in Table I.]

Number of trees.	Description of trees.	Average weight per fruit (ounces).		
		Green grade.	Tree-Ripe grade.	Both grades.
77	Open strain	4.317	3.573	4.087
121	Entire plat	4.348	3.616	4.172
10	Lowest producing (irrespective of strain)	4.330	3.534	4.199
22	Lisbon strain	4.351	3.706	4.249
8	Dense-Unproductive strain	4.350	3.804	4.321
10	Highest producing (irrespective of strain)	4.415	3.849	4.345
3	Sporting strain	4.428	4.052	4.387
11	Bull strain	4.479	4.007	4.439

The variations in seed content in the several Lisbon strains from month to month throughout the year are presented in Table XIII and the data for the Open, Lisbon, and Dense-Unproductive strains are shown graphically in figure 11. The irregularities for November

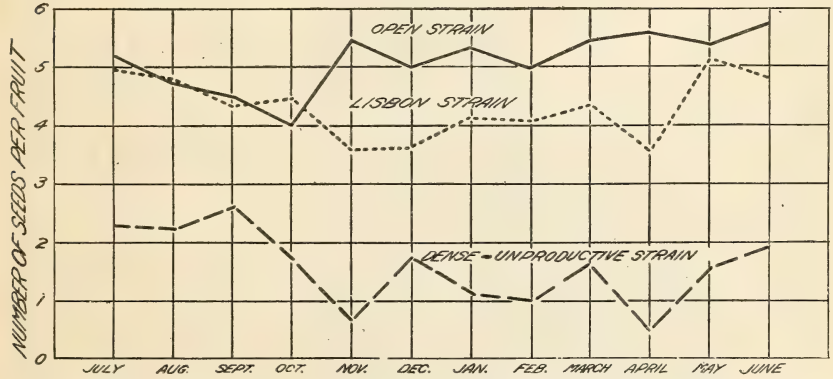


FIG. 11.—Diagram showing the average number of seeds per fruit of some of the strains of the Lisbon lemon found each month on trees in the investigational performance-record plat during the 3-year period from July, 1913, to June, 1916, inclusive.

and April are probably accounted for by the fact that owing to interference of one sort or another records are available for only two seasons in November and for one season in April. The periods of lightest and heaviest crop production are known to vary somewhat from year to year, as already shown, and it is believed that in the same manner the seasons of high and low seed content fluctuate in different years. Hence, with records for only two years for November and one year for April, while the other months are represented by data for three years, it is quite probable that the relative variations as shown are somewhat incorrect.

TABLE XIII.—*Average number of seeds per fruit picked from lemon trees of the various strains of the Lisbon variety in the investigational performance-record plat during each month of the 3-year period from July, 1913, to June, 1916, inclusive.*

[The trees of the Bull strain and three other trees, indicated in Table I, were added to the plat in 1914, so that the records here presented for those trees cover the 2-year period from July, 1914, to June, 1916, inclusive.]

Number of trees.	Description of trees.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	For the period.
77	Open strain	5.20	4.73	4.50	4.00	5.45	5.01	5.33	4.99	5.46	5.57	5.38	5.73	5.07
10	Highest producing (irrespective of strain)	4.96	4.13	4.44	5.05	4.24	4.45	3.87	4.14	4.93	3.60	5.77	5.73	4.69
121	Entire plat	4.92	4.60	4.26	3.95	4.64	4.42	4.78	4.53	4.95	4.60	5.03	5.23	4.67
22	Lisbon strain	4.95	4.80	4.33	4.45	3.58	3.63	4.14	4.09	4.36	3.53	5.11	4.81	4.39
11	Bull strain	4.98	2.79	3.73	4.03	2.69	3.34	4.05	4.41	4.84	3.12	5.53	5.59	4.24
3	Sporting strain	3.43	3.60	1.75	3.14	3.69	3.46	3.52	3.71	3.00	3.75	2.60	2.29	3.09
10	Lowest producing (irrespective of strain)	3.04	3.47	3.21	2.06	2.30	2.45	2.39	2.08	3.20	1.90	2.40	2.62	2.61
8	Dense - Unproductive strain	2.29	2.24	2.62	1.73	.68	1.73	1.15	1.00	1.63	.52	1.56	1.92	1.67

COMPARATIVE VALUE OF THE STRAINS.

The individual-tree performance-record studies of the Lisbon lemon variety have shown that only two strains are of commercial value. These are the Lisbon strain and the Open strain. Trees of the Lisbon strain are very productive and commonly bear most of their crop during the spring months. The trees are hardy and more or less resistant to unfavorable climatic conditions. For this reason in particular the Lisbon strain seems to be well adapted for locations exposed to strong winds or where high or low temperatures or other extreme climatic influences are likely to affect the production of the trees.

The production of heavy crops by the trees of the Lisbon strain under normal conditions during the early spring months frequently necessitates holding much of the fruit in storage until the late summer or fall. However, the vigorous growth characteristic of the trees, the protection of the lemons in the trees by the rather dense foliage, and the fine quality of the fruits are factors which must be taken into consideration by citrus growers.

The trees of the Open strain of the Lisbon variety have the habit of producing more or less regular crops throughout all seasons of the year. While this characteristic is not so marked as in the case of the trees of the Eureka strain of the Eureka variety, it is very striking when compared with the behavior of the trees of the Lisbon strain. The crops from the trees of the Open strain, while not as great as those of the Lisbon strain for the entire year, are likely to be more valuable, because they are produced more heavily during the seasons when the market is usually the best and lemons bring the highest prices. The fruits of the trees of the Open strain are not as well protected from sun and temperature injuries, nor are the

trees apparently as hardy as those of the Lisbon strain. For certain conditions, however, it seems probable that the Open strain is the most valuable one for commercial lemon production. The trees of the Open strain have fewer and smaller thorns and the fruits are more easily picked than those of the Lisbon strain.

THE UNINTENTIONAL PROPAGATION OF UNDESIRABLE STRAINS.

In the earlier stages of the lemon industry in California propagators considered fruit characteristics as a definite measure of the value of parent trees for bud wood. Later, the importance of the fruits in the selection of parent trees as sources of bud wood was entirely lost sight of. Bud wood was taken wherever it could be secured with a minimum of time, labor, and expense. As a result, it was frequently procured from vigorous-growing trees of vegetative strains, which often are least productive and least desirable. Some propagators, believing that the size of the tree was correlated with production, when cutting bud wood secured it from the largest trees in the orchard. Nurserymen often cut bud wood from trees in the nursery rows or from sucker growth on fruiting trees. The result of these various practices was the unintentional propagation of many worthless strains.

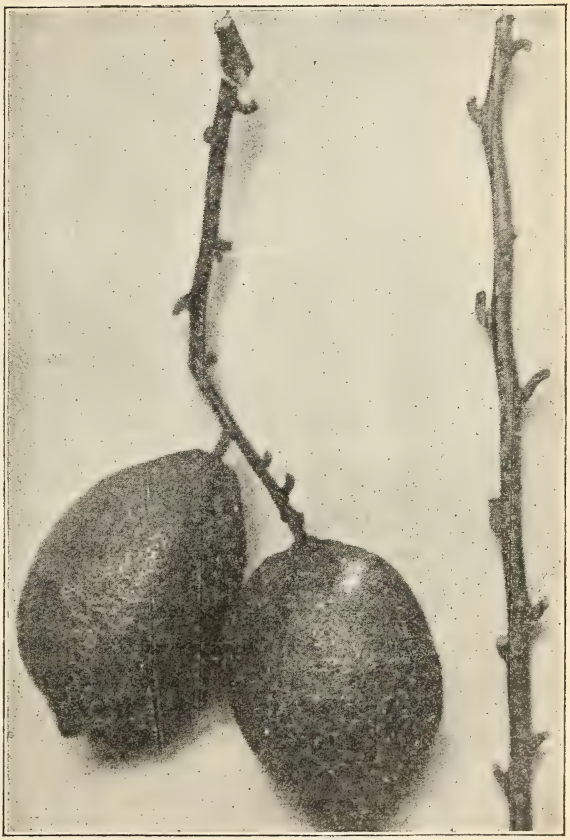


FIG. 12.—Fruit-bearing lemon bud wood with typical fruits attached to one stick. The bud sticks, after being cut and trimmed, should be packed in slightly moistened sphagnum moss and held in a cool room until needed for use.

In the course of these investigations the method of using fruit-bearing bud wood, as shown in figure 12, has been evolved. The use of fruit-bearing bud wood with the fruits attached has largely

eliminated the danger of the unintentional propagation of worthless strains of the Lisbon lemon. When such bud wood is used it naturally results in its being obtained from the most heavily fruited trees, as these trees have more available fruit wood than trees of vegetative or poor-fruited strains. When bud wood is taken from fruit-bearing wood of performance-record trees the danger of propagating undesirable strains is greatly reduced.

THE ISOLATION OF STRAINS THROUGH BUD SELECTION.

The orchards of the Lisbon lemon variety include trees of many diverse strains which have originated from bud variations. In this bulletin the description and characteristics of some of the important strains are presented. Some of these strains, on account of their low and inferior production, are not worthy of propagation. Other strains produce fruits low in acidity, with little or no juice, of undesirable shapes, of coarse texture, or with some other undesirable characteristic. A mixture of strains in any commercial orchard is undesirable and is likely to depreciate the value of the orchard.

The first step in these investigations was the determination of the relative value of the different strains of the Lisbon lemon for commercial production in California. The next step was the isolation of the important strains through bud selection. This was accomplished by propagating from performance-record trees those which were typical of the different strains and in this propagation using only fruit-bearing bud wood with typical fruits attached to the bud stick. The oldest trees which have been propagated from typical trees in the performance-record plats are now 5 years old from time of planting. The young trees are now bearing commercial crops of fruit, and performance records are being obtained from many of them.

While the progeny data obtained are incomplete as yet, a sufficient amount of information has already been secured to warrant the statement that each of the important strains of the Lisbon variety has been isolated through careful bud selection. This does not mean that individual tree variations are not encountered in these young trees, because variations within the strains are found which are similar in degree to those of the parent trees. However, there has been no mixture of strains, and in every case the same differences which characterize the parent trees are found in their progenies.

TOP-WORKING UNDESIRABLE LEMON TREES.

The investigations have shown that in many lemon orchards there are a number of healthy unproductive trees of undesirable strains. These unproductive trees usually can be successfully top-worked by using bud wood selected from fruit-bearing wood on superior performance-record trees. Figure 12 shows typical fruit-bearing lemon

bud sticks after they have been removed from the tree and are trimmed ready for use.

While it is possible to practice top-working during quite a long season, commercially it is usually done through the months of April,

FIG. 13.—Unproductive lemon tree of the Villa Franca variety top-worked with fruit-bearing bud wood of the Lisbon strain. The nurse limb shown at the left was allowed to remain for one year. The photograph was taken two months after the buds were inserted.

May, and June. In the course of these investigations it has been demonstrated that the best results have been secured during May and early June. Previous to top-working, the trees should be pruned, so

as to allow free access to the limbs in which the buds are to be placed. Usually from three to five strong limbs should be selected which can furnish the framework for the new top. The buds should be inserted in the limbs from 1 to 2 feet from the forks. Two buds are

FIG. 14.—Unproductive lemon tree of the Villa Franca variety top-worked with buds of the Lisbon strain. The photograph was taken one year after the budding was done and soon afterwards the main framework limbs were again cut back and only one growth from the rebuds was left on each limb. This tree and the one shown in figure 13 are in the same orchard and were top-worked at the same time.

generally placed in each limb, and as one of these buds is likely to develop if this method is followed a perfect stand usually can be obtained. In about 10 days or two weeks after the buds have been inserted they will form a union with the limbs and the wounds will

have healed. The limbs should then be cut off about 6 inches above the buds and all other branches removed from the tree. In some instances, as shown in figure 13, one limb of the original top, known as a nurse limb, is allowed to remain in order to preserve somewhat the balance of the tree. It is questionable, however, whether anything is gained when this method is followed, as just as good results have been observed in the course of these investigations where all the limbs are cut back to a point about 6 inches above the buds. The cut surface should be immediately covered with grafting wax, asphaltum, or some other protective material. The trunk and main branches are protected from sun injuries by a coat of whitewash.

An unproductive tree of the Villa Franca variety which has been top-worked with bud wood from a productive tree of the Lisbon strain is shown in figure 14. This tree is comparable with the one shown in figure 13, with the exception that the young top represents 10 months' growth. In about a year from budding, or when the tree is in the condition shown in figure 14, the stubs of the rebudded limbs should be cut back again, making a smooth, sloping cut, and leaving only one sprout from one bud on each limb. The cut surfaces should be covered with grafting wax or some similar material. The young top-worked trees must be closely watched for several years and all sprouts from below the buds removed; if not, the young top will include branches from the original unproductive top and the whole object of top-working will be defeated. Under normal conditions the top-worked tree with selected buds from superior parent trees should begin bearing the second year after rebudding, and in the third and fourth years should bear good commercial crops.

REPLACING UNDESIRABLE TREES IN BEARING ORCHARDS.

In many old bearing orchards undesirable or unhealthy trees are frequently found, and it is often more economical to replace these trees with younger ones from selected buds rather than to top-work them. Owing to lack of attention to details, until quite recently it had been generally assumed that such replanting would prove unsuccessful. Experience has shown, however, that when proper care is used undesirable lemon trees in old orchards can be replaced with young trees grown from selected buds.

The undesirable or diseased trees should be removed from the orchard during the late summer or early fall, and immediately after the older trees have been taken out holes should be dug for the new trees. These should be at least 5 feet in diameter and from 2 to 3 feet in depth. The holes should then be filled with good topsoil which has been mixed with well-rotted manure. The loose soil and manure should be allowed to settle in the holes during the winter and early-spring months. In placing the soil in the holes a sufficient

quantity should be provided so that in the spring the soil will stand at least 6 to 8 inches above the land in the orchard. This will provide for any future settling.

In the spring the young trees are planted in the place thus provided for them. Especial care must be used to provide sufficient water for them at each irrigation, which is often accomplished by making an irrigation furrow at the side, or frequently by making a basin around each tree. Small applications of a quickly available nitrogenous fertilizer, if applied to the young trees, often stimulate early growth. When care is exercised in properly preparing the holes for the trees, in furnishing adequate irrigation water, and in distributing additional fertilizer if needed, the replanted trees in an old bearing orchard will make as good a growth as if planted as solid blocks of trees in a new orchard.

THE SELECTION AND CARE OF BUD WOOD.

Bud wood should be taken only from fruit-bearing wood on performance-record trees. In addition to the performance records, the propagator should have an intimate knowledge of the behavior of the individual tree. This can be obtained only by careful studie of the variety and strain which he desires to propagate. The lemons which are attached to the bud sticks can be used as an indication of the type of fruit which the buds on the sticks will produce. The use of this type of bud wood guards against taking wood from sporting or undesirable branches.

Plate VIII shows two variations found on separate branches in a lemon tree on which all the other fruits were of the Lisbon strain. By using buds taken from sticks with the fruits attached the danger of propagating these undesirable variations is eliminated. If this type of bud wood is used, more buds can be cut from productive trees than from unproductive ones.

Enough experimental and practical evidence has already been collected in the course of these investigations to show that fruit-bearing bud wood from productive trees is the most desirable kind to use for propagation. Nursery trees from this type of wood make a very vigorous growth and come into early fruiting. After the bud sticks are cut the leaves are removed, as shown in figure 12, and the sticks from each tree are tied in separate packages, with the number of the tree marked on the end of one of the bud sticks and also on a wooden or other suitable label which is tied to the bundle. In this way the progeny of each parent tree can be kept separate. As soon as the bud sticks are labeled they should be wrapped in moist sphagnum moss or some other suitable material. If it is necessary to store the bud sticks for any length of time they can be put in a cool room where the temperature is about 70° F. and does not fluctuate greatly.

As a result of the citrus-fruit improvement investigations, in May, 1917, the California Fruit Growers' Exchange, a cooperative organization of about 8,000 citrus growers, inaugurated a bud-supply department, which was established as a public service, its purpose being to furnish bud wood from performance-record trees of all the important California citrus varieties to growers and nurserymen. As this department was established for the good of the whole citrus industry its privileges are not restricted to members of the exchange, but buds are distributed at cost to all who apply for them. Buds are cut only from trees on which performance records have been obtained for several years. These trees are located in orchards which are well-known producers of superior crops of valuable fruits. The purchaser, if he cares to do so, has the opportunity of visiting the individual parent trees in the orchards from which the buds come, and he can inspect the records and examine the fruits of these trees. Only fruit-bearing bud wood is used, and the fruits from the bud sticks are returned to the owner of the trees. Each lot of bud sticks is kept separate and is labeled with the number of the parent tree or with a key number. The grower or nurseryman receiving the buds therefore can keep the progeny of each parent tree separate. Men who have been thoroughly trained and have an intimate knowledge of the important variations in the standard citrus varieties are exclusively employed for this work. In this way the industry is distributing wood of the best lemon strains only, and it is reasonable to expect that the young orchards which are planted with trees propagated from this type of bud wood, and older orchards which are top-worked, will eventually bear the best type and quality of fruit.

SUMMARY.

The important commercial lemon varieties now grown in California are the Eureka and Lisbon. The Lisbon variety was introduced from Australia about 1874, and later in 1875, with perhaps less-important later introductions.

Several important strains of these varieties have resulted through the unintentional propagation of bud variations. In this bulletin only the variations within the Lisbon variety are discussed. Descriptions of variations in the Eureka variety will be found in United States Department of Agriculture Bulletin No. 813.

Bud variations are of frequent occurrence in some of the trees of the Lisbon variety. Some of the strains which have developed from them are inferior in quality and quantity of fruit and mature the fruits at seasons when there is no great market demand for them. These strains occur as variations in the habit of tree growth, in characteristics of the foliage and blossom, and in the color, shape, texture, juiciness, and other characteristics of the fruit.

The object of these investigations has been to determine the behavior of trees of the different strains and of the individual-tree variations within the strain, to prevent the propagation of inferior strains, to develop practical methods for eliminating undesirable trees in established orchards, and to isolate and propagate the desirable strains and superior trees within these strains through bud selection based on individual-tree performance records and intimate tree knowledge.

The plan of work as followed in these investigations has been to secure individual-tree performance records in carefully selected plats of the Lisbon variety. Each tree is picked separately, the fruits assorted, counted, weighed, detailed notes taken, and other data obtained, so that after a series of years definite conclusions concerning strains and individual-tree behavior can be drawn.

In these investigations five strains of the Lisbon lemon have been studied, their characteristics described, and the performance records of individual trees recorded.

Some of the lessons taught by these studies include the discovery of the importance of bud variations, the comparative value of the different strains arising from them, the need of eliminating the unprofitable strains and isolating the valuable ones through bud selection, and the origination and introduction of improved methods of propagation for conserving and improving the production of the Lisbon lemon variety. The desirable strains can be isolated by means of careful bud selection based on individual-tree performance records and intimate tree knowledge.

Undesirable healthy trees or inherently unproductive ones in established orchards usually can be successfully top-worked by using select fruit-bearing bud wood from performance-record trees.

Undesirable unhealthy trees in old-established orchards can be replaced with desirable younger trees which have been propagated from selected fruit wood, provided proper attention is given to the preparation of the planting hole and, later, to care in irrigation and fertilization.

Only fruit-bearing bud wood from superior parent trees which have been selected on the basis of their performance records and from intimate tree knowledge should be used for propagation or for top-working.

The California Fruit Growers' Exchange, a cooperative organization of 8,000 citrus growers, has established a bud-supply department as a result of these investigations. This department furnishes at cost to growers and nurserymen bud wood from superior performance-record trees.

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